

COMPUTER WORLD

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NEWS IN BRIEF

Court Modifies Order on IBM Use of Census

(Related story on Page 23)

TULSA, Okla. — Judge A. Sherman Christensen has modified a previous order that had prevented IBM from using a census of the DP industry compiled during the Control Data Corp. case.

Christensen's revision empowers each court in which IBM faces legal action to decide whether to admit the census as evidence and to establish its own protective order for the use of the material.

This means the contents of 12 file cabinets turned over to government attorneys may be used in the IBM-Justice case, although Judge David W. Feltstein has not yet ruled whether to admit the information.

The protective order keeping the material private remains in effect until each individual judge decides whether to allow the use of the material.

The census was ordered by Judge Philip Neville during the Control Data suit and was released for use in the Telex suit.

County Board Sued

Over Program Contents

Special to Computerworld

PHOENIX, Ariz. — The question of whether government computer programs are public documents, and hence open for public inspection, may soon be answered in Arizona.

B.C. Lumbert, a computer consultant in Cave Creek, Ariz., recently brought suit against the Maricopa County Board of Supervisors to force them to reveal what the county had obtained in return for nearly \$1 million spent on outside systems analysis and programming. The contracts for services were generally not offered to local firms and were not the result of competitive bidding, Lumbert said.

On the Inside

The Computer Caravan Supplement
Follows Page 18

Ascope Appeal to User
Despite High Failure Rate — Page 16
IBM, Burroughs Earnings
Soar in 1973 — Sat Records

—Page 23

Communications	16
Computer Industry	23
Editorial	10
Financial	34
Professional Practices	11
Software/Services	13
Systems/Peripherals	19

Fuel-Starved Get Emergency 'Fuel' Line

Allocation Program Aids Pennsylvanians

By Don Leavitt

Of the CW Staff

HARRISBURG, Pa. — Because the DP staff of this state's Central Management Information Center (CMIC) was able to adapt techniques from an on-line system already under development, Pennsylvanians can now get quick and authoritative solutions to fuel allocation problems.

Over 500 calls a day are handled by the new Fuel Users' Emergency Line (Fuel) system at the state capital here. Fuel is believed to be the nation's first computerized emergency allocation system aiding citizens during the energy crisis.

The programming that controls the system will be made available to agencies in other states, according to a spokesman for CMIC.

Hardship Cases

"The system saves us time, personnel and paperwork," commented J. Robert Ippolito, director of CMIC. "It allows us

And a Free Carpool Program!

By a CW Staff Writer

DETROIT — A carpooling program that runs efficiently in only 20K bytes of memory and a manual describing how to use it are available free, from Burroughs Corp., to "any organization, any government that wishes to use it, anywhere in the world."

Written in ANS Cobol, the coding can be easily modified to run on any kind of computer that has a compiler based on the published Cobol standard. It is not restricted to Burroughs installations.

To use the "Operation Energy" program, an organization must define a

system of X,Y coordinates for the area to be served; a set of codes for the destinations to be reached, defined by the X,Y grid; and a file of potential participants including, for each, his home area, again by X,Y definition.

The software can match participants against up to 99 different destinations within a given geographic area. Thus a large corporation with several locations in a city can set up potential pools to all sites in a single pass of the program.

A municipality can help set up pools serving groups of small businesses.

(Continued on Page 2)

allocation officer in the next room for the final decision.

File Updated

As further action is taken, such as assignment of a dealer by the state with the approval of the Federal Government, the citizen's computer file is updated. The file can be retrieved immediately on a scope as needed.

Under the Mandatory Allocation of Distillate Fuel Program of the Federal Government, each state is allowed a 10% emergency fuel reserve. This means the

(Continued on Page 2)

Packet Switching, Boon or Bane? — Part I

Telenet Plan Benefits Heavy Data Users

By Alan Taylor

Special to Computerworld

WASHINGTON, D.C. — A new packet-switching network filing which is expected to get Federal Communications Commission approval very soon includes a provision for letting heavy users of the network pay only one-eighth the charges that others must pay to transport the same amount of data. These 88% quantity-discount provisions are included in the filing by Telenet, a subsidiary of Bolt, Beranek & Newman, which operates parts of the Advanced Research Projects

Agency packet-switching network under government contract.

Quantity discounts are not new. The already-approved Packet Communications (PCI) network sample tariff shows a maximum 2-to-1 ratio of charges. The Graphnet network, which (while primarily for facsimile operations) can provide for data communications also, offers no quantity discount in its sample tariff. The Arpa network does not charge for the use of its circuits, a quantity discount is not involved there.

The geography of the Telenet network being proposed is almost identical in its development and final extent to that previously approved for PCI. Both systems start with a Boston-Washington core, develop into a 16-area network and then a 62-city net. Of the 16 areas in the Telenet proposal and 15 duplicate ones on the PCI one, there are no fewer than 58 duplicates on the 62-city Telenet.

Railway Planning

The duplication involved suggests that development of first networks is being planned along the same standards as railway networks were planned in the last century, despite the operations of the FCC which must ensure orderly growth.

In a recent Computerworld interview Telenet Vice-President Stuart Mathison confirmed that Telenet was working on the assumption that the FCC approval was already at hand. It has significantly advanced the timing for the first customer use of the network. While the filing indicates this will be 15 months after approval, Mathison now says it is planned for "late '74," or at least three months

earlier.

Mathison also said that since the filing Telenet had retracted the concept of equal treatment for all U.S. computer connections accessing the public network. This is one of the features in the filing, and one which has been implicit in the previous arguments for packet-switching [CW, Feb. 7, 1973].

At the time of the filing Mathison said Telenet assumed that by not making vigorously in distant areas it would be able to discourage some users from con-

(Continued on Page 4)

Conversion Ills Blamed for Delay In Aid Checks

By E. Drake Lundell Jr.

CW Washington Bureau

WASHINGTON, D.C. — Treasury Department has confirmed that thousands of aid payments to the aged, blind and disabled are being delayed because of a massive snafu in the computer system used to print and address the checks.

More than 3.5 million people are affected.

The problems, Treasury officials said, appear to be hitting recipients hardest in California and New York City and were caused basically by inadequate preparation for the conversion from a state and

(Continued on Page 4)

Drop It From Language

A Taxing Solution to Tasking?

Special to Computerworld
NEW ORLEANS, La. — The PL/I Standard Subcommittee may have solved the problem of defining tasking adequately for inclusion in the PL/I standard. The solution, put forward by Data General's Craig Franklin at a committee meeting here, is to drop it from the language as standardized.

Franklin argues that application programs which have to be machine-independent will not be affected by the change, since tasking is mainly used in the system programs which will not be transferable in any event.

Currently the committee is investigating the practicality of removing the facility from the standard.

Defining tasking which involves the use of asynchronous operations — is troublesome because a very loose definition would easily be ambiguous, while too tight definition would mean a loss of

machine independence, and would also restrict the efficiency with which the language could be implemented on different machines. Currently only IBM has actually implemented the tasking facility.

One problem is that many other facilities, such as multiple opens, have been described in the draft under preparation as tasks. However, the logic problems involved in rewriting these definitions are much less for the PL/I committee since the standard draft is being maintained by IBM under its Administrative Terminal System in Hursley, England.

This provides much easier drafting and incorporation of changes than is possible where standard drafts, such as the Cobol one, are maintained manually.

Blue Cross DPers Strike

NEW YORK — The Blue Cross computer operators' strike here [CW, Jan. 16] went into its third week amid a series of meetings, including Board hearings on the strikers' desire for representation by the International Brotherhood of Electrical Workers.

Management personnel continue to operate the Blue Cross computer installation and are getting the work done without significant problems, according to Vice-President for Systems David Benjamin.

Peter Petino, spokesman for the striking operators, said the strike will be over as soon as Blue Cross recognizes IBEW Local #83 as the computer operators' representative.

The primary issue in the strike is job security, with the strikers citing an alleged order given to their acting supervisor to fire three operators who had made an error in their work.

The operations manager refused because of the three operators' previous good work records and was subsequently transferred to another job, the strikers say.

Benjamin said there was no order to fire three operators and suggested Blue Cross' intention to shift from Honeywell to IBM equipment may have made the operators uneasy about the future of their jobs.

Allocation Program Up and Running in Month

HARRISBURG, Pa. — By working "18 to 24 hours a day," the Central Management Information Center (CMIC) staff was able to get the Fuel System up and running in less than a month.

Pennsylvania has about 11 million families using "middle distillate" fuels. The state's Department of Community Affairs, in mid-November, that the emergency system be established and operational by early December. CMIC, which handles the state's payroll, personnel, and other data, took on the

nel records and other applications, took on the job and assigned 17 people to the project.

File maintenance and communications management previously worked out for an on-line personnel management system were adapted to Fuel.

This made programming relatively easy, according to John Kunzler, assistant director, programming division. But development was hampered — as in so many projects — by changing specifications; in this case revised federal regulations under which Fuel was to operate.

Pennsylvania may have been lucky in trying to get Fuel operational very quickly, Kunzler noted recently. "We didn't have time to do any fancy. We kept it loose and that made it adaptable to the changes as they came along."

Development of the data base of suppliers and dealers was difficult, the assistant director went on, since no existing sources of information indicated what type of data the computer companies needed. The regulations, at least when Fuel was conceived, applied only to the middle

distillate fuels, he added.

The programs are written in Cobol, with communications handling managed by an extended form of Unisys-developed File extension manager (FEX) software under Exec VIII operating system.

The System Worked For Jack Tucker

HARRISBURG, Pa. — Jack Tucker spent half of December 1972 working in London while his wife stayed with her parents. Tucker turned the thermostat at home off for days during their absence.

Following federal guidelines, the state delivered 15% less fuel in December 1973 than Tucker had used in the corresponding month of 1972.

The dealer's hands were tied, so Tucker called the emergency number in Harrisburg, explained the situation to the Fuel Allocation Center, and waited. He then received authorization to provide Tucker with an adequate supply of oil.

Burroughs Has Free Carpool Plan

(Continued from Page 1)

each in a particular part of the city. The destination codes could also be used to identify workers on different shifts or departments at a single site.

After matching participants and destinations, the program sorts the records be-

fore printing any results. Printouts are produced first, by destination; then, by department; then by destination and then, alphabetically by persons within department.

File maintenance of the participant file is supported and printouts after updating cover only those people directly affected by the changes, Burroughs noted.

The organization using "Operation Energy" can specify the number of matches the system should attempt for each participant. The present excessive lists where many people with the same destination live close together.

It also works to keep the system trying to find a match for a participant even when a participant seems to be rather isolated. If few matches are found in the participant's home area, the program scans adjacent areas seeking more matches. The search is vectored along the participant's most logical route to his destination.

The vectored approach affects the printout given the participant. It lists potential partners in order of descending probability; those closest to his home are listed first; those farther away appear near the end of the list.

The program has another feature useful to rural or suburban areas. Participants can specify how far they are willing to drive to share a ride. This allows the vectored search to be extended even further.

The two volumes of the Operation Energy package — management guidelines and a list of the program source code — can be requested from any Burroughs office. The corporation has also set up a coordinator's office at its headquarters here, to handle questions or problems that may arise in use of the program.

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Pennsylvanians Get Emergency 'Fuel'

(Continued from Page 1)

state, after federal approval, can reallocate up to 10% of the supplier's 1972 usage, if available.

The Unive 1108 keeps an update file on about 22 fuel suppliers and about 1,200 wholesale dealers in the state, with their allocation quantity. The computer can also show how much oil is allocated to various areas, like countries or municipalities.

If an emergency allocation is approved, the system sends a copy of the approval form to the supplier authorizing him to release fuel.

The system can also immediately issue reports on the amount of fuel allocated in hardship cases by regions or individual areas and it can show the percentage of requests approved or disapproved.

Dures Gives Mini Virtual Support

(Continued from Page 1)

separation of instruction and data space so the operating system can handle a user program up to 64K word long, and a program segmentation and swapping scheme to provide a virtual memory beyond the size of available real memory.

Under Dures, even a minimum 11/45 configuration can support a program as large as one such packed 64K program. Datalogics claimed, admitting, however, that the amount of physical memory available could "drastically" affect a program's execution time.

Ten to 12 tasks, each 64K words long, can be supported "comfortably" on a 124K-word system, a spokesman said.

The system supports teletypewriters, IBM-compatible 9-channel magnetic tape, card readers, line printers, paper tape I/O, OCR scanners and CRT-based editing terminals. To date, both Data Disc 5000 and Beehive Super Bee terminals have been used with the system, the spokesman said.

Most Programs Unmodified

The system CALLs and the operator keyboard commands are superfluous of the changes by DEC's DOS for the PDP-11 and most programs that run under DOS will run unmodified under Dures. Programs that include device-dependent I/O

instructions or direct use of DOS data or code might not be executable, the company said.

The system looks like its own copy of DOS to each user program, the spokesman added.

Dures uses the memory management facilities of the PDP-11 to protect the system and other users from a user's program. The filing system supports multi-user activity and includes enough logic to resolve conflicts among programs trying to modify or delete files simultaneously.

Automatic task switching and interrupt-driven I/O support contribute to process and memory utilization. Spooling and message-switching facilities are provided to allow flexible assignment of terminals, input devices and printers, the spokesman noted.

Hardware program modes are used to separate the system into three levels: User (U); Supervisor (S); and Kernel (K). The U level can be run under U-S or K; the S level can CALL S or K; the K level can CALL only K. This "leveling," plus the fact that U, S and K share no common memory, protects the system "fairly well" from user errors.

Cost of the basic Dures software, installed on a single processor, is \$25,000. Tailored multi-site and multi-line installation support are available separately. Datalogics is at 325 W. Huron, 60610.

When that low-cost tape you bought sends your wife running home to mother, here's a note to your mother-in-law:

Dear Mother Gubb -

I'd appreciate it if you'd tell Shirley
I have not deserted her and the kids.

My job has been taking a lot of
extra time lately. What I thought
was a good deal on some computer
tape turned out not to be such a
good deal.

Tell her I'm going to switch to
Graham's Epoch 4 - it's the best
there is! And it'll only cost the company
6¢ a month. (So maybe I'll get a raise.)

I'd like her to come home again.
But if she doesn't want to, ask her
what she did with my brown striped
socks.

Charley



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Marketing, Not Technique, Makes Nets Attractive

Special to Computerworld
WASHINGTON, D.C. — Inadequate user choices of available data communication methods, rather than any great technical advances, appear to be the key reason for the apparent attractiveness of many of the packet-switching networks. When a user

tentials for transmission, the user has to use the line at the lower maximum, thus increasing the minute-by-minute charges or slowing down the effective transmission rate along the 24-hour-a-day service.

Three-Way Improvement

Packet-switching methods can increase the use efficiency in three ways. They allow each piece of equipment to work at the maximum rate, while the network organizes the operation of the long-distance links so it is also working as efficiently as possible under the second-by-second loads. For under one second tasks there is nothing currently around to equal packet-switching and here the technical characteristics of the networks show their best advantage.

For slower uses — such as file-

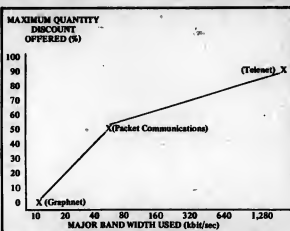
sharing, program-movement, input-collection or report-provision — there are a number of techniques available. But users are able to use them cooperatively with others (which is required for volume efficiencies), not because the techniques concerned are bad but simply because AT&T currently restricts connection rights to value-added (packet-switching) vendors for re-sale.

For long-haul cases, where the distance the message is being sent is considerable, the user who needs AT&T local connections cannot obtain efficient use of the most expensive part of the connection — the long-distance line itself, except by using the packet network. Such users therefore, in the absence of any other way of bringing real efficiency to long-distance operations, will be attracted to the packet-switched networks, not because of any basic technical advantage of the technique, but simply because of the realities of current communications marketing methods — and because of the power of AT&T to oppose organizations like MCI and Datanet practically indefinitely.

Restrictive Tariffs

Thus, it is not surprising that the current sample tariffs offered by the two data communications packet-switching networks, Telenet and Packet Communications, Inc., are also somewhat restrictive. No price advantage is provided for the user who does not need interactive, one-second speeds.

While the traditional data movement systems, such as those supplied by RCA, have three price levels depending upon the degree of priority re-



Graph shows discounts offered on the three packet-switched networks.

quired, the packet networks are only providing a single deluxe service as far as speed is concerned.

But the service, as described in the FCC filings, won't be deluxe in other ways. No provision is made, for instance, for economizing on network hardware by holding nonpriority messages during peak conditions outside expensive core memory. Nor is provision made for holding archival files so that a recipient of a message (or its sender) can look at the data later.

14% Overhead

Instead, as soon as the receiving station notes that the cyclic check characters have checked out, the network is dropping the message from its records. The technique itself adds around 14% overhead to the messages.

Whether the current conditions in data communications market-

ing will continue indefinitely no one can tell. Telenet apparently thinks the current condition will prevail, and is talking in terms of several Mbit/sec requirements soon. Telenet has gone to a satellite system to provide the necessary band width.

In its filing to the FCC no attempt is made to break down the expected volume of usage between the under one-second areas, where there is clearly a proved advantage, and the other voluminous areas where neither experience nor any of the suggested examples indicates more than an AT&T-approved method.

U.S. Aid Checks Mired in Delays

(Continued from Page 1)

local operation to one-run by the Federal Government.

In question is the Supplemental Security Income Program now run by the Social Security Administration, which took over operation of the program Jan. 2 from state and local jurisdictions.

The problems arose "because we did not have time to be properly prepared" for the conversion, a Treasury official admitted.

Previously the checks had been mailed to the recipients by almost 1,100 different state and local agencies, many of which had incompatible computer files or which were not computerized at all, the official said.

The problems were caused by an attempt to create a master file of all the names of the aid recipients with their proper addresses. The official warned that the problem still exists.

"We're going to have to live with this for a while," he said, noting it would be several months before the whole situation could be straightened out.

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Heavy Users to Benefit

(Continued from Page 1)

netting.

In addition, he said, the company would not lose too much if a user insisted on being connected, as the maximum loss seen on line charges would be about \$2,000. At the same time Telenet estimated that any customer ready to pay the substantial installation and monthly charges would actually be paying the firm upwards of \$10,000/mo., which would more than cover the \$2,000 line loss.

However, Telenet has since found that some users with a comparatively light load, which Matheson said "we would not want to service anyhow," still qualify under the tariff filed. Telenet therefore decided that some restrictions on just who would be allowed to connect into the public network on equal terms would be incorporated in the final tariff when it was put forward.

The proposed tariff terms call for payment of 0.4 cents per packet (approximately equivalent to a line of print, or a card of input), as well as monthly payments of at least \$800 for the computer connection.

The full 88% quantity discount, which reduces the packet rate to 0.048 cents, is only available to users who send over 10 million packets a month, and only appreciably reduces the average packet cost when vol-

umes of about 15 million to 20 million a month are attained.

By this time the network fee will be in excess of \$25,000/mo.

Both from the angle of pure computer capacity (this works out at over 10,000 messages per hour, 24 hours a day, of working day in the month) and also using the Arpa approximation that communications should cost no more than 20% of the computing cost, this \$25,000/mo fee indicates that only very large systems (Model 370/155 size and up) can hope to get equal charge for equal work on the network.

Another level of exclusivity is involved in the lack of any provision for open public access to the network facilities. Joining the network involves the acceptance of at least a six-month contract, at \$800/mo, installation charges running from \$1,000 and an indefinite delay until appropriate software and line connections are provided.

No provision of "coin-box" operations or of dial-in hookups is included in the plans, although no technical reasons why such connections are impractical are mentioned in the filing.

The network is based upon the use of leased AT&T lines, as well as satellite communications, so interconnection from any AT&T-connected computer or terminal appears practical.

Suit Claims Vendor Failed to Put Proposal Promises in Contract

Special to Computerworld
NEW YORK — Contract differences have resulted in a \$1.5 million lawsuit filed by a user against his vendor. The main issue appears to be a charge that promises made in a proposal were not included in the final contract, which was nonetheless signed by both parties.

Angler's Co., Ltd., Flushing, N.Y., filed the suit against Honeywell in U.S. District Court here.

Honeywell confirmed knowledge of the allegations in the suit, but a spokesman said in accordance with corporate policy, no comment would be made.

Denies Support

Angler's claimed a passage in the proposal assured the user Honeywell's support commitment would be written into the contract for a Model 58 computer. Later, according to Angler's, Honeywell

denied the support had been promised and refused to supply it.

The suit asks for both remedial and exemplary damages against the computer vendor on the grounds that the absence of support provisions in the actual contract was fraudulently concealed from Angler's.

Angler's claimed it was misled about the meaning of the contract it signed with the computer supplier, and that if it had believed the contract did not include adequate support "to insure a timely and efficient installation," the firm would not have signed it at all.

In the original proposal a provision was made that "all systems and programs described in this contract will be installed on a turnkey basis," Angler's said. No charge was to be made for this support provided Angler's took a five-year lease on the system, or purchased it within a year of the original contract, the firm added.

NYSE Refunds Fees, DP Savings Cited

NEW YORK — A New York Stock Exchange subsidiary is refunding excess fees to its users, due in part to budget savings in data processing.

The Depository Trust Co., which uses DP to transfer ownership of securities by bookkeeping entry, has announced a refund of \$1.2 million.

DP savings, a spokesman said, resulted from the replacement of all 1050 on-line systems and primary data systems tied in with 2260s, with Four-Phase computers to be used as data entry devices. This reduced the number of data entry personnel from 60 to about four keypunch people, he said. An additional savings was realized by the implementation of optical scanning equipment, he added.

CDP Exam Review Planned

WASHINGTON, D.C. — The fifth annual CDP Review will be presented here by Computedics, Inc., Feb. 11-13.

The review will cover the five sections of The Certified Data Processor examination: data processing equipment, computer programming and software, principles of management, quantitative methods and systems analysis and design.

Cost for attending the Review is \$275. For further information contact Computedics, 1629 K St., N.W., Suite 500, 20006.

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Security Checklist: Plan for Emergencies

TORONTO, Ont. — A simple way to determine the security of your computer system is to check it against the following checklist of security "musts" concerning emergency procedures:

- Establish a group of management personnel who are computer security specialists, independent of the computer management, and who are responsible for implementing security measures and seeing they are enforced.
- Prepare a security manual documenting:
 - Emergency procedures for shutting down computer equipment, air conditioning, electricity, gas and water.
 - Instructions for closing fire doors, locking cabinets, using fire extinguishers and evacuating the building.
 - Procedures for handling data under normal and emergency situations.
 - Procedures for performing a se-

curity check of each area at the end of the working day.

• Periodically review the security plan for adequacy and appropriateness and distribute revisions to all employees concerned.

• Post employee instructions for emergency situations on bulletin boards throughout the computer center, and include telephone numbers for the police department, fire department, hospital or doctor and management personnel responsible for the installation.

• Establish procedures for verifying that a genuine emergency exists.

• Assign specific responsibilities to each employee in case of an emergency, and hold periodic drills of emergency procedures.

• Periodically contact your local fire department and police station to tour your premises and to discuss security hazards and procedures.

This checklist was compiled by PCF Systems Ltd., 74 Victoria St., Toronto, Ont. M5C 2A5.

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This unique user's forum is in the advance planning stages and will become a regular feature during the second half of next year. Whenever a DP manager tells us about a sticky problem he's facing, such as Absenteeism, which other users have also indicated is a problem, we will telephone a representative group of DP managers to determine how they are handling that particular problem. We will then analyze the responses and report the results through regular Manual Portfolios.

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Students' Carpool Plan Going Big Time

DENVER - A question posed by a social studies class to a math class at George Washington High School here about matching would-be carpoolers by computer has meant a bonus for the city.

A computer program, written by a senior, is being run on the school's Univac 1106. The administration agreed to let the students donate processing time to run the program for other institutions in the city as well as the schools.

Plans call for the program to be transferred to a computer at a private industry, where it will be run on a large-scale basis for City of Denver employees and possibly for the City of Denver at large, through cooperation with the Rocky Mountain AAA club.

The Fortran program takes ordered

Service With a Smile

Transit Field Feeling Impact of Dial-a-Rides

BOSTON - Wouldn't it be nice to have public transportation pick you up and drop you off at your doorstep? It might even make you take the bus instead of drive, right?

That's exactly what's happening in about 40 cities in North America thanks to research conducted by Dr. Daniel Roos, professor of civil engineering at MIT.

"All the Dial-a-Bus systems have the same concept of a personalized door-to-door service, where people with common origins and destinations are grouped together," Roos said, "but really there are no two that are identical."

Roos headed up the group which wrote the software for the system under a government grant. The original program was written in Fortran for implementing on the IBM 360/370 series, but it has since been modified. For instance, Dial-a-Ride, in Haddonfield, N.J., is using a mini for its fleet of 18 buses.

"The information can be relayed to the

NCIC Marks a First

WASHINGTON, D.C. - Last December marked the first time the file size of the National Crime Information Center (NCIC) exceeded five million records. As of Dec. 1, there were 5,014,385 active records in NCIC, with a partial breakdown showing 138,955 wanted persons; 898,515 vehicle; and 437,125 criminal history records.

pairs assigned by addresses and matches them up by an expanding radius, explained Evert Karman, of the mathematics laboratory.

First, it hunts two-tenths of a mile away from the original location in all directions and lists applicants in that area. It keeps expanding until it either finds six people or gets to the ceiling limit of two miles, Karman observed.

The students have been assigning the ordered pairs by hand, but are working on a program to do this, he added.

"We think we can do this, and are trying to get some federal funding," he said. "The closest thing to that that has been done is something the Census Bureau came up with..." he noted.

The students designed an input form comparable to an 80-column punch card, which would-be commuters fill out indicating such factors as address and commuting time. After the ordered pairs are assigned, the forms are keypunched.

Carpool matchings for the Air Force Finance Center and Great Western Sugar Co., as well as for the students, have been made.

The Air Force run involved about 1,800 applications, and the program was modified to accept military time, Karman explained.

At registration each student will receive a carpool application form along with other material, and Karman hopes that will yield about 1,000 students looking for rides.

Transit Field Feeling Impact of Dial-a-Rides

driver using either voice communication or digital communication," Roos said. "We've worked with Rochester, N.Y., to put in the first system using digital communication. This is using a Motorola Mobile Printer so that specific messages for specific drivers are printed on the console in the bus."

Ability to Update

For routing, the computer's memory stores a representation of the area covered by the system, thereby allowing it to devise and update optimum routes between pickup points.

"The state-of-the-art is that computers are being used to determine the best routing for the buses," Roos said, "but they have not yet been interfaced with the digital communication." Therefore, a

human takes the computer output and transmits it to the driver. "But," Roos claimed, "it's very simple to take the next step to integrating the whole system."

Quick Action

"This is really causing quite a major impact in the transit field, which is one that hasn't changed very much," Roos said. "It can be implemented very quickly. You don't have to go out and take land and you don't have to construct facilities." In fact, it is already starting to be integrated with existing transit operations, he added.

The system, he concluded, can be used to give wide range coverage in areas of low and medium density, where most growth is occurring, yet where fixed transit routes are unprofitable.

Strong Demand Seen for DPERs

NEW YORK - The demand for computer engineers and scientists is expected to continue as strongly in 1974 as in 1973, according to a study by Deutsch, Shea & Evans (DS&E), a consulting and advertising firm. The firm bases its prediction in part on the performance of its Engineer/Scientist Demand Index, an indicator based on recruitment advertising directed to technical people in major newspapers and technical journals. The 1973 Demand Index showed a sustained upward movement in employment

opportunities for technical people in a number of fields. DS&E attributes this increased and ongoing demand to several convergent trends within the economy: capital equipment needs, technical breakthroughs, new defense projects, the impact of antipollution and OSHA regulations, an upturn in research expenditures and the oil and energy problems.

DS&E also predicted an increased use of telecommunications as a substitute for travel, creating more employment opportunities in that field.

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TOPAZ

Finding the Optimum Work Schedule—Part I

12-Hour Shift Gets General Approval

By Jonnie Sears Jr.

Special to Computerworld

Conversion to a six or seven day-a-week, around-the-clock operation can expect to encounter stiff opposition from the employees.

The Regional Computer Center (RCC) in Cincinnati made this transition about six years ago because of commitments to low laborment users.

Through the joint effort of city and county officials, we have been able to supplement more than 25 environment and economic management information systems, in addition to the Police Information System, Project Clear (County Law Enforcement Applied Regionally).

The Clear system is a real-time teleprocessing communication network incorporating the combined efforts of city and county law enforcement agencies.

Since the operations staff had indicated it preferred not to work on weekends nor on a schedule which rotated its assignments from days to nights, we decided to invite each operator to join in creating a schedule to accomplish our goals. The only restrictions were:

- Twenty-four-hour operations for our systems.
- A balance of technical skill, experience and supervision at all times.
- Sufficient shift overlap so that we could maintain a continuous flow of work.
- A schedule acceptable to the major-

ity of employees.

First we tried an eight-hour schedule of three non-rotating shifts and provided off days every two out of three weekends. There were several serious drawbacks:

- Frequently a person was scheduled off for one day before returning to work.

The rising cost of data processing is causing revolutionary thinking for many DP managers. As the cost for equipment, personnel and supplies continues to increase they must constantly devise means of getting more utilization from their equipment. This two-part series details how one center succeeded by converting its work schedule.

- It was very difficult to maintain a balance of skill and supervision at all times.

The schedule required readjustment for vacations and illnesses causing disruption to the personal plans of those working the schedule.

As a result, this schedule was abandoned.

The first introduction of the 12-hour shift was met with caution. The primary concerns centered around the fatigue factor caused by the extended work period and the possibility of permanent night assignments.

The primary innovations of this plan were the establishment of two shifts, rather than three, and the avoidance of shift rotation.

Operators are divided into A and B cycles. Each cycle consists of a day and night team; four teams have the following designations:

Cycle-A	Cycle-B
Teams	Teams
Day-A	Day-B
Nite-A	Nite-B

Each team works approximately 12 hr/shift, which allows each cycle to span an entire day. Therefore, Cycle-A is off whenever Cycle-B works.

Day teams report at 05:00 and end at 18:15; night teams report at 18:00 and end at 06:05.

The shifts are designed to provide a 15-minute overlap at each changeover, so that all pertinent information can be passed on to the arriving team. Day lunches are scheduled for one hour. The night shifts preferred only 40 minutes for

lunch because of the few eating establishments open at the time of their lunch periods.

The 12-hour schedule sold itself. After comparing the pros and cons of the other suggested plans, the 12-hour shift emerged as the overwhelming preference. We put it into operation about six years ago and since our payroll system operates on a biweekly basis, the schedule is designed to have each operator work 80 hours over a two-week period.

The average American worker puts in 22 workdays per month compared with only 15 put in by our operators.

When you consider the importance of conserving fuel today, not to mention the cost, this amounts to a hefty 32% savings for each operator. While the total number of off days was great, the female operators were extremely pleased that the distribution of work days more than offset the possible fatigue factor from working a 12-hour shift.

Discussions with members of the operations staff revealed general satisfaction with the schedule. They cited the extra days off each month along with the Friday day off every other weekend (Friday, Saturday and Sunday) as the principal advantages of the schedule.

Jonnie Sears Jr. is assistant supervisor for operations for the Regional Computer Center in Cincinnati, Ohio.

From the Frying Pan And Into the Fire?

CHESAPEAKE BAY, Md. — Fortunately, one of two men escaped drowning when they both fell from a bridge scaffold in Chesapeake Bay. Unfortunately, when state police requested a National Crime Information Center (NCIC) check on the survivor they found he was wanted in a southern state on forged charges.

The man, who was painting the bridge at the time of his fall, was rescued immediately and treated at a nearby hospital. Suspicious circumstances surrounding the identity of the rescued man caused the investigating officer to request a check through the Maryland Interagency Law Enforcement System (MILES). After confirmation of the hit with the original source of the record, the man was returned to the southern state to stand trial.

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Welfare Check Suit Thrown Out of Court

PHILADELPHIA — A federal district court here has dismissed a suit against computerized welfare checks in Pennsylvania's Delaware County.

The suit sought injunctive relief, according to the Delaware County Legal Assistance Association which served as counsel for the plaintiffs.

"Essentially we were concerned about the fact that they had put the digital payment system into effect without notifying the welfare recipients," said David Scholl of the association. Under the new system payments would be made on different days, and the lawyers were concerned because welfare recipients had not been notified they would have to budget for the partial checks they would receive during the transition period.

At Last A Guide To Understanding COMPUTER CONTRACTS

With contracts for computer installations taking so many different forms, it has been extremely difficult for data processing managers and their company attorneys to have access to all aspects and ramifications involved.

To remedy this increasing problem, DPMA is introducing the answer in a new 52-page guide called "Understanding Computer Contracts," by Dr. Phillip J. Scalletta, Jr. and Joseph L. Walsh.

This reference is the only one of its kind and analyzes purchase and lease contracts in depth, paragraph by paragraph. It is MUST material for anyone who is involved in the consideration of a computer installation or those who want to find out if their present contracts do, in fact, meet their needs.

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Editorial

An Index on Computer Abuse

Any person with management responsibility in a computer center can undoubtedly benefit from the report on computer abuse, published recently by the Stanford Research Institute.

Security specialists, as well as programming supervisors, operations managers and the management team in general may marvel at the ease with which many computer-related crimes were committed.

In cold, hard facts, removed from the panic atmosphere of newspaper headlines and the somewhat biased generalities of those in the consulting community, the SRI team describes the actualities, with statistics and interviews.

As the SRI team said, this may be the first attempt to document and define the problem of computer abuse. Furthermore, the report can alert business and other users, as well as the technological and sociological research communities, to the "seriousness, extent and potential" of computer abuse as a "new and emerging, serious, social and technological problem."

The computer abuse study was supported in part by the National Science Foundation, and copies of the report are available from SRI, Menlo Park, Calif. 94025.



'My Advice is to Go to Jail Instead— This Gets Your Arrest Warrant Out of Our Computer File'

Letters to the Editor

Bringing Suits or Protecting Technology?

I have read the letter from Martin A. Goetz [CW, Dec. 19] and the Xoma patent is referred to and I agree in part with his opinion on the necessity of software patents but he whole the Xoma patent is not well founded. From the content of his letter I must assume he has not bothered to read the patent and is just taking a position on the patentability of software in general.

The patent, if it had been submitted to any technical publication as an article, would have been, in my opinion, rejected as lacking in technical content. The "patent" could have been designed by any experienced systems analyst working 10 years ago.

A patent to be granted should be new, unique and non-obvious to someone trained in the field. After reading the Xoma patent I do not believe it satisfies any of these requirements. I would hate to see the argument for patents on software hinge on this patent. I would rather see something that is truly a "revolutionary" improvement in software, that is

truly new and unique, be patented and then enforced against subsequent users.

Goetz also stated that the courts "will then determine the actual novelty and validity of..." the patent when Xoma is unenforced.

This is, in my opinion, a basic mistake. The whole idea behind the patent office is to study and determine if the patent claim is indeed valid and to eliminate those that are not new, unique and non-obvious.

Since a patent protects the idea behind the "device" and not just an exact copy (as with copyright), it is much broader in its protection. It is the job of the patent office to determine, in advance, validity and not over-protect the courts with new and complex cases.

The threat of litigation, and its associated costs, is a powerful weapon that should not be treated casually. The software community must be protected from the patent claimant whose only purpose is to bring suits for infringements and not actual protection of a new technology. My personal opinion is that software requires something between patents and copyrights. Protecting the basic idea is too

restrictive, e.g., patents on Cobol, Fortran, input routines, etc., but copyright on the actual code that makes up a Cobol compiler is too weak.

What we need is protection of the logic and the function of individual compilation units and their functional relation to create the whole. This would protect the implementation, and the techniques used, as opposed to the philosophy of the system.

Henry F. Herre
Project Manager
Data Technology
Fireman's Fund American Insurance Companies
San Francisco, Calif.

Statistics Can Be Bent To Support Any Claim

The glowing Dec. 19 article on the Gumbler Canada keypunch incentive plan experiment demonstrated some highly significant results—namely that statistics can be bent to support any conclusion.

Along with the supplied data, assuming a stable employee base, a \$3/hr average wage and that the 60% reduction in absenteeism resulted in a still high 5% absence rate, all imply 12,760 salaried hours, a wage base of

\$38,280, with total keypunch expense of \$49,451 in the three-month 1972 period. The \$5,059 savings due to the experiment represents a 10.2% improvement in cash outlays. However, based on the number of records processed, productivity declined by 11.3%.

Sanford J. Garrett
New York, N.Y.

E.J. Balawder, the user who wrote the article, replies:

I agree with Garrett's comment that "statistics can be bent to support conclusions." He is also correct in his assumption of a stable employee base. Unfortunately, Garrett also assumed that the "no. of records processed" could be used as a quantitative measurement in valuating staff performance. However, this data was not used in determining effective productivity due to a significant change in the format of one main transaction in 1973 (keystrokes per record increased by a ratio of 4).

The purpose for publishing the "no. of records" was to give readers some appreciation of volumes we process in terms of records as this is the most common method used in industry today. The article does, however, point out an improvement of 8% in keystrokes per hour during the test period. This was directly attributable to the program.

Ideas Create Standards

I must disagree with Herb Grosh that the "System/3..." (was) the most anti-standard system in computer history" [CW, Jan. 16]. Standards are written by the "know-it-alls" while standards are created by ideas.

These people may have written a lot of standards that satisfied their idea of what a computer was, but the fact remains there was nothing that could be called a computer available to small businesses. Then IBM, the same IBM that is being attacked for its

dominance, developed the System/3 and is now dominant in the small business system market.

The 80-column card standard must have been comforting to those who are alarmed by any kind of change. However, the System/3 cards weigh less, take less space, require a card reader with roughly half the number of parts required by the "standard" 80-column card reader and costs half as much. This "non-standard" computer is now the most widely used computer in the world.

David E. Ferguson
Group/3
Los Angeles, Calif.
President

Will Real Author?

Dan McCork's letter in the Jan. 9 issue suggests I was wrong in assigning authorship of the "Newco" plan to the CIA. This surprises me since my source was CIA's own publication, *On Line*.

In the Aug. 20 issue of *On Line*, almost two pages are devoted to describing the "Newco" idea. The article starts with a summary of various ways of reducing IBM's "control over the world computer and data processing industries."

The "Newco" proposal then follows. In the final paragraphs, benefits are described for IBM shareholders, users, the U.S. balance of trade, the industry and IBM employees. The only major problem is said to be standards, but this, it is suggested, could probably be solved quite quickly.

In a postscript the CIA says it "has not taken a position as to the ONE BEST (their emphasis) solution to the problem of excessive concentration of power in the computer industry," but hopes the "Newco" proposal will stimulate discussion.

Perhaps we can return to a discussion of the main issue, namely how, or should, the computer industry be restructured.

Bruce Glickstein
New York, N.Y.

You WILL Like These New Systems...

By Ronald A. Frank

On the way out

It appears the public is being dragged kicking and screaming to utilize point-of-transaction systems to automate common everyday routines. But for whose benefit are these systems being implemented?

There is growing evidence that the consumer is not beating a path to the nearest computer terminal. A case in point is the demise of the In-Touch bill-paying system that allowed Seattle area bank customers to pay their bills from a Touch-Tone telephone at home.

Another example is the controversy generated on these pages regarding the merits of Electronic Funds Transfer Systems.

If we accept the indignant arguments from the bankers that the needs of the consumer play a major role in the implementation of these systems,

we are left with one burning question: Why has'n't more effort been devoted to educating (or is it selling?) the consumer on all the conveniences he is about to get?

Perhaps one of the best insights into this situation was given recently by a computer veteran who

Commentary

remarked that the consumer does not run his affairs like a business. And the home is not run on a 30-day balance-the-books type of cycle.

Has it ever occurred to the bankers that a 20-second automated bill-paying transaction may not be as desirable as a few minutes of pleasant conversation with a teller you know, and a pass-book or check you can see, hold and trust?

Professional Practices

Presidential Commission Should Study DP Standards

By Pal Skoze

Special to Computerworld

The economic health of data processing, involving the livelihood of tens of thousands of data processing professionals, is dependent upon a continued flow of further investments in information systems. To obtain such a flow, data processing will have to provide more reliable systems and a more reliable environment in which the systems can work. Without

My experience has been that presidential commissions produce good study reports, which although are not always directly used, become influential in the creation of new structures. However, before this conclusion can be accepted, the reasons for rejecting other possible solutions must be given.

One possible method would be to continue to use the current standard-making organizations—the various professional societies, the American National Standards Institute and the International Standards Organization. I reject this idea because these organizations have been in operation by-and-large for at least over a decade.

Yet, despite this, and despite their pre-eminent positions, when I go out in my normal practice I find a constant history of failing DP projects. For instance:

- An accounts receivable system—required to keep a firm from closing down—still was not completed on time (or within budget or with adequate quality).

- A major aerospace corporation is investing in an obsolete financial system without knowing it. (A standard of the knowledge of the state of the art is needed.)

- Thousands of taxpayer's dollars spent in trying to convert DOS to OS was acknowledged wasted when the conversion was abandoned. (Standard of forecastability of results needed)

- Another DOS to OS conversion in a

major department store is being completed with a more than tripled budget and times schedule. (Another example of standard forecastability needed.)

- Two international automobile corporations found a standard software package not performing according to expectations and had to scrap major portions of a planned system. (Standard of correctness of information needed)

That such elementary standards as these seem to be needed in so many areas, and

The Professional Practices Panel is coordinated by Alan Taylor and the editorial department of *Computerworld*. Articles should be sent to Alan Taylor, c/o The Professional Practices Panel, Computerworld, 797 Washington St., Newton, Mass. 02160.

that there is nothing the current structures of organizations have produced which make it possible to determine whether the estimates and performance figures are, in fact, invalid for competent professionals, indicate both the need for some standards and also the lack of ability of the current organizations to perform them.

I think we need institutions such as:

- Academy of Information Systems.
- Federal Agency for Computer Systems.
- National Library for Systems and Programs.

These, however, will only be successful if, unlike the current standard ac-

tivities, they are properly directed. In order to obtain this, urgent and drastic steps are needed. The reason I like the idea of a President's Commission of Information Systems is that it could:

- Investigate the existing organizations of data processing with respect to their purpose, form of organization and their relative importance.

- Look into current practices of these organizations and recommend legislation, if necessary, to safeguard sound progress.
- Review the quality and efficiency of federal organizations and related projects with respect to the proper use of data processing.

- Evaluate the steps necessary to improve the quality of data processing education.

- Make proposals to redirect and speed up standardization efforts within data processing.

- Recommend the creation and funding of the minimum number of new institutions needed to safeguard our further success in data processing.

Without some such program I can foresee the flow of investment in information systems being drastically curtailed in the future, and users making do with patched-up versions of old programs, instead of risking employment of professionals who cannot be trusted to provide reliable information.

Pal Skoze is the president of International Data Processing Corp., Agoura, Calif.

Viewpoint

this, the current high risk of investing in data processing will inhibit even the current level of investment, and can lead to unemployment in large sections of the profession.

It inevitably means that standards are involved—standards as to how existing organizations should operate. These standards will involve the creation of standard-making institutions and organizations. The task then is to see that the right and effective standard-making organizations are created. The prize is continued and perhaps even expanded employment for the professionals, and a much better return on investment for employers and backers.

Influential Body Needed

Professionally, I believe the matter is of such national importance that it should be studied by a presidential commission.

Job You Save May Be Your Own

Let's Get Quality Programming

"... A sophisticated program in the hands of some untrained official could have disastrous consequences." This was one of the arresting phrases that jumped out at me from a letter written (see box). The author of the letter was a government statistician who, I think, knows what he is talking about.

His point is a good one. And after receiving his letter, I checked out his thesis with two randomly selected programs that were expected to be used by a number of people. These programs are both on major public networks where subscribers come in, obtain the use of a library and then expect to trust the results they receive.

The first program I looked at was on the GE network. It dealt with a return on investment operation. The program was written in such a way that if rules regarding parameters were broken—a garbage-in situation—then instead of aborting or printing out that no valid result could be obtained, the program actually did print out a perfectly good-looking result.

The technique used by the programmer was to put what appears to be the key element, the return on investment itself, at the end when the user had selected it. The programmer assumed that any such output would not be used. Why he did

not put out a diagnostic I cannot imagine. But he didn't.

If the user inspected the manual closely he might see that when an output of zero occurred, there was a possibility that the input had been wrong. But he did not think this a professional way to do things, and certainly it is the type of operation which could produce dangerous results in the hands of untrained officials. But the danger lies in the lack of programming quality, not the lack of theoretical knowledge.

The second test dealt with the original rainfall program—waterflow. It was on another network, Control Data's Cyber-nat.

The test program was able to solve one unknown, given two out of three possible known flow in cubic feet per second, depth of water and width of stream or streamlet.

Thus the person who knew the maximum width of a stream and who could also measure the depth could use the program to find out what the maximum allowable cubic feet per second flow would be. By contrast, if he knew the cubic feet per second flow, he could find out the depth of the stream.

But How?

In trying to run the program, first the test program was run and worked perfectly. Then we tried to enter some real sample values. Here we had problems.

The instructions simply said to enter two out of three parameters. It did not tell you how to enter the second and third parameter when you did not want to enter the first one.

In the test case it had been the

last parameter that had not been entered, so that was simple. In the second case, however, it was the first parameter that was to be eliminated. How do you enter a second parameter without entering a first one?

The instructions gave me some clues. They noted that two of the parameters were restricted in values. One had to be greater than 2.0, while another had to be less than 2.0. The programmer had clearly decided to use an arbitrary limit to help him select the missing parameter. Typical programmer cleverness on a par with using a zero return when a calculation cannot be made.

Even so, the program still did not run. It turned out later that it also required instructions to the input for the use of some nonexistent tape!

These programs make a case for the existence of the dangerous situation to which Johnson refers. But they also show that poor and inadequate programming, specifications and general expertise rather than, or at least as well as—lack of theoretical understanding, is what is effectively stopping the use of valuable programs by at least the trained members of the general public.

I cannot see why we continue to tolerate such poor programming practices. Good quality programming—and both of these programs could easily be made into good quality programming—is surely in everyone's best interests.

A profession of programming based on the "test and see" concept will not last long. The concept that as long as we do poor quality work, so that only

A Question of Understanding?

Deaf Mr. Taylor:

I read with interest your Nov. 28 column suggesting that data processing could better attain the status of a professional rendering services to society. While DP professionals may well be able to perform *pro bono* public services, the suggestions given in your column are, I believe, inappropriate.

Basically, you suggest that copies of programs already developed to a library, where they could be distributed to public agencies for their own use. As an example, you cited the possible use by local agencies of a Corps of Engineers program to simulate the impact of a proposed levee development being built on wetlands. The program may be excellent, but it is only a tool, and should only be used by those who understand the theory on which the program is based.

As a statistician familiar with the usefulness as well as the shortcomings of computers, I regularly use statistical techniques, neatly incorporated in a computer package, misapplied by users who are able to set up the control cards but do not fully comprehend the assumptions underlying the technique. I do not suggest that only statisticians have access to statistical programs, but I do believe that tools should not be indiscriminately applied.

I fear your suggestion would enhance the probability of drawing improper conclusions. In the suburban development example, the need is for an engineer or hydrologist, who may in turn require a computer program. But to place a sophisticated program in the hands of some untrained local official could have disastrous consequences.

In your column you regularly present outstanding examples of a useful tool—the computer—improperly applied by persons who lack understanding of the uses and limits of the computer. Your suggestion could result in a compounding of this type of error.

Douglas H. Johnson

Staten Island, New York

U.S. Department of the Interior
Northern Prairie Wildlife Research Center
Jamestown, N.D.

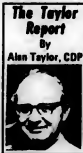
others who have full-time in the mystique of programming and who are prepared to tolerate such tolerances, and quality control can be expected to use them successfully, is one which has serious implications upon the future employability of programmers in general.

If we do continue to accept such, then we can expect technology to find some way of using programs that do not use programmers, either to create

them, to maintain them or to run them.

And that is not as impossible as it may seem. So let us make products safe to use—even by local officials. The job you save may be your own.

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Recruiting DP Personnel — Part I Define Needs Before Picking Prospects

By Lou Fried

Special to Computerworld
Finding and hiring the right person for a DP job remains one of management's most critical problems. Critical because the needs of every organization can only be met by an adequate number of qualified personnel. Systems analysts and programmers are a somewhat unique product because the quality and quantity of a company's production are directly related to the quality and productivity of the individual employee.

Define Needs

The first and one of the most important steps in the recruiting process is clearly defining the needs of the organization and the characteristics expected of the employee who will fill that need. The needs of the organization should be detailed in writing including the specific assignment in which the employee will be used, the performance expected in that assignment and the beginning salary range that the company is willing to spend on this position.

The characteristics of the employee should be described in writing in terms of:

- Years of experience.
- Specific systems experience.
- Hardware and software knowledge.
- Specific skills.
- Educational qualifications.
- Personality characteristics (if appropriate).
- Management or project leadership skills.

For some reason it seems the ideal person to fill any given opening is already satisfactorily employed somewhere else. Finding the right person for the position is a function of finding the right group of people from which an individual can be selected. The following methods are arranged in a sequence that indicates those which have produced the most favorable results.

The first preference is reference. A recommendation by a present employee (who is considered to be himself a reliable performer) is extremely desirable. Employees who come into the organization in this way are frequently easier to introduce into the organization's methods and more closely fitted to the organization's requirements (because of the recommender's knowledge). As a result, these employees become productive faster.

Professional recruiters are next best preferred if they are capable of screening to meet defined needs. The requirements must be defined with extra care and precision.

Finding and hiring the right people for DP jobs is one of management's most important jobs. The series looks at ways to find, screen and interview candidates, make the final offer and introduce the new employee to the organization.

Recruitment by a professional recruiter will be ineffective. Although the fee of many recruiters may cause some hesitation in their use, it is frequently profitable to utilize their services because recruiters have access to personnel who may not be actively seeking employment and who therefore could not be reached through usual advertising media.

Advertising in trade journals is another way of reaching a broad segment of that group of people who are not actively looking for employment.

Advertising in regular community newspapers is normally a last choice since it is indiscriminate in nature. That is, it reaches a broad spectrum of the public

and usually results in an extensive amount of work in screening resumes.

Also, it frequently does not reach that group of people who are currently employed. However, it is frequently the least expensive approach in terms of out-of-pocket costs.

If this type of advertising is used, it is most effective to use a display at (at least 6 column inches) placed in the "Career Opportunities" or some other specialized section for professionals.

The space available in a display ad should not be wasted. It should be used to clearly spell out the qualifications, the nature of the position and the nature of the company.

Radio and television advertising have occasionally been used, but this is a very expensive media if measured by response per dollar spent.

If the requirement is for entry-level personnel, direct contact with schools may provide a list of candidates.

Part II will discuss ways of screening and interviewing potential employees.

Lou Fried is vice-president, MIS, Title Insurance & Trust Co., Los Angeles.

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SOFTWARE & SERVICES

How One Company Went to VS—Part II

Six Partitions, Using 2,488K Bytes, Run in 384K

By Samuel J. Shliss
Special to Computeworld

PHILADELPHIA, Pa. — In January 1973 SmithKline Corp. here began to evaluate VS1 seriously. We were outgrowing the system we had and a decision had to be made.

One alternative was to get more equipment, which would only be utilized at peak periods.

Instead, we chose to try VS from an

economical point of view. VS1 release 2.0 was the system to be generated. The target date was June 1973 for production testing.

The system was generated with six partitions, totaling 2,488K. The 370/145 system was supported by 384K of main memory, 16 331-cpi spindles, eight 2400-type tape units, a 2501 reader and a 1403 printer.

IBM gave us as much assistance as was

needed, and in March 1973, just two months after we started, the system was being tested. A one-day orientation was held to familiarize the operation with the host reader and writer, as well as other features. An orientation was also given to the programmers so they could take advantage of the VS concepts. It was emphasized that no reprogramming would be necessary.

All JCL remained the same. Thus, the new system was transparent to the programmers except they now had 128K instead of 92K as per standards. Also, the 1410 emulator, which was always a core hogger, now could run in one partition and did not interfere with any other jobs.

We now had a 512K partition available for teleprocessing or a large program. This partition has been used many times for "one-time" jobs with no interference from the other partitions.

Dynamic dispatching, a feature of VS1, enhances the CPU I/O time for each partition by changing the dispatching priority for the partitions so we now can run job mixes independent of being CPU bound. This provides us with greater flexibility in scheduling.

The four parameters which control dynamic dispatching can be changed at IPL time through a PARM entry. This is one example of how VS1 uses parameters to give more flexibility after VS1GEN time, and to relieve unnecessary operator interaction with the system.

End-of-Month Problems

When end of month came in May, we began having problems with some standard label control labels which were being VORI instead of VOL1.

IBM responded with some traps and

fixes which were put on the system.

Then we had a problem in the 2804 control unit which is a two-channel switch to eight tape drives, and it seemed to be most prevalent when activity was very heavy. IBM brought in people to help and we wrote a test program.

User Casebook

Given a substantial amount of computer time, IBM's people finally trapped the problem, developed a fix and applied it in time for June's end-of-month processing.

VS1 rose to the occasion and ran through end-of-month with no major problems. For the first time in months the machine was idle at a busy time.

The next problem was to fix the scheduler ABENDS and to fine tune the system. We realigned SYS1.LINKLIB, SYS1.PAGE and the component libraries. We normally have two system packs which hold the operating system. One of the packs had, before realignment, both SYS1.PAGE and SYS1.LINKLIB. After realignment, all scheduler ABENDS and other small problems disappeared. The system made its production deadline with all bugs removed.

Thinking the June end-of-month closing was luck we went into July's end-of-month processing. Once again all work was finished without any problem and the machine was idle. The question, should we go to VS or not, was surely answered.

Samuel J. Shliss is systems support coordinator for SmithKline Corp., Philadelphia, Pa.

OS Users Get 'Show' on the Road With CRT-Based Control System

By Don Leavitt
Special to Computeworld

MCLEAN, Va. — Large-scale IBM 360/370 installations using OS gain massive support for the work that precedes actual program execution, with the Show job setup and production control system from Tedsata Systems Corp.

Accessed by CRT terminal, Show currently includes backing for JCL and job stream setup and changes, card-to-tape/disk operations, and catalog and data set maintenance. Software utility interfaces, scroll and display services to monitor and control work queues, and interactive control of RPG programs are also part of the system.

The options are presented in "menu" format on the operator's screen and selections continue until the stage is set for actual work by the operator. Access to the various services is controlled by user ID and password security checks.

The accesses can be altered and the list of services extended as needs change, noted spokesmen for Fireman's Fund Insurance Co., San Francisco, where Show was developed for internal use.

With the setup option, users invoke skeleton JCL at the terminal, then substitute real parameters for symbolic ones. On command the system syntax checks the JCL and the user may enter corrections at the CRT.

Once the job is defined, Show generates a hard-copy setup sheet of needed tapes and submits the job itself to the system queue. At Fireman's Fund, all disks are on-line all the time so Show does not list required disk data sets.

The card-to-disk or tape feature includes support for control through specific parameters or through defaults built into the system to handle "normal" transfers from one media to another.

Options under catalog maintenance include building or deleting indexes, connecting or releasing volumes, and cataloging, recataloging or uncataloging a data set. The data set maintenance facilities allow renaming, protecting or scratching a data set, working with members of a

partitioned data set and displaying direct access space available on a disk pack. Under the scroll and display services, users can review lists of active jobs, and modify the lists to reschedule jobs if that is required. Jobs in the input, punch and print queues can likewise be displayed, as well as data sets in use and information from volume table of contents (Vtoc).

Show's debug services support development of user-written modules, protect and monitor system integrity and display internal control blocks. The debug services include an asynchronous interrupt facility and other on-line programming tools.

The system, written in Assembler, requires 150K bytes of memory, and is available for \$29,000 plus \$11,000 for installation and first-year maintenance. A lease plan includes \$14,000 installation cost plus \$1,200/mo.

Tedsata is at 7900 Westpark Drive, 22101.

T/S Net Adds Test Service for IMS Programs

WALTHAM, Mass. — Users developing applications for an IMS/360-370 environment can test their programs and related DLI/ CALLS on a time-shared basis with the DLITEST service now available on the Interactive Data Corp. network.

The service simplifies the test environment through test data and control block generation facilities and on-line debugging, including source-level patching and data initialization without recompiling.

The test data generator overcomes the basic problem of shifting a data base from the user's in-house installation to the time-shared net. In addition, DLITEST supports on-line DBO and PSB generation and modification, an Interactive spokesman noted.

DLITEST works with Interactive's Integrated Symbolic Debugger (ISD) to produce executive time diagnostics, in English, related to the user's Cobol or Assembly source code. Several data display

options are available on- or off-line, in hexadecimal or character format, for the whole test data base or any segment, the spokesman added.

ISD allows programmers to insert new instructions in source language and to modify program flow to branch, for example, around existing code or to pick up

execution at any specific point.

Programs tested under DLITEST can be run under IBM/360-370 without modification.

DLITEST service is available on the Interactive network at normal computer time charges, the spokesman said, from 486 Totten Pond Road, 02154.

PDP-11 Sort/Merge improved

CAMBRIDGE, Mass. — Installations using DEC PDP-11 minis for business applications should be able to significantly upgrade their operations with the enhanced Sort/Merge-11 package from TLM Systems Associates.

The independent's utility is said to be seven times faster than DEC's COS Sort and even twice as fast as an IBM-supplied sort used under OS/360 on a 360/50.

Sort/Merge-11 includes full peripheral device support; ability to handle fixed or variable length records; and acceptance of sort keys that may be any of six data types. Users exist add to the package's flexibility, TLM added.

Four versions, each with specific options, are available with prices ranging from \$1,950 to \$6,750. The company can be reached through P.O. Box 172, 02139.

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BUSINESS FORMS, ENVELOPES, SUPPLIES

Mini Fortran Tests Eased

PLAINVIEW, N.Y. — Users of various mini and small systems can have interactive Fortran debugging with the Breakpoint program from Binary Systems Inc.

This development aid forms a test bed for the user's program and allows the setting of temporary halts so that the user can check the value of pertinent variables at various processing stages. The test points are defined by user source code statement line number and the variables, by symbolic name.

At each breakpoint, the user can examine and change variable values, as seems appropriate. The breakpoint can then be reset, relocated or suppressed, and the program restarted so the effect of the changes can be studied later.

The changes entered under Breakpoint are only temporary and, if needed regularly, they eventually have to be posted to the source program for recompilation.

Breakpoint is currently available for the IBM 1130, and for DEC, Data General, Hewlett Packard and Modcomp minicomputers. Source code of the debugging program and user's manuals can be purchased for \$200, from 88 Sunnyside Blvd., 11803.

Bank Uses 24K For Trust Work

ORLANDO, Fla. — Bank trust departments with as little as 24K of main storage available for application programs can receive daily customer status reports from an automated trust package recently released by Florida Software Services Inc. (FSS).

The system prints an array of reports, including trial balances, investment totals, overdrawn accounts and large cash amounts, all on a daily basis. Review routines provide estimates of income and yield calculations at regular intervals or on demand.

Statements, both by property or security and by client are provided on user-specified cycles, and the system also handles recurring transactions such as mortgage or tax payments.

The system is a complex one, the company added, but overlays permit it to run in 24K on any IBM 360/370.

Distributed in source code (Cobol) the package is available for \$9,200, from FSS at P.O. Box 2269, 32802.

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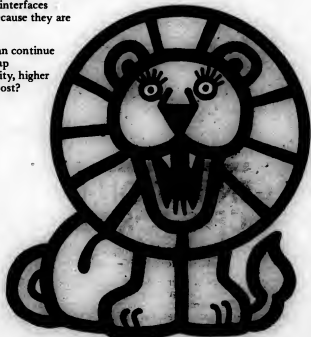
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One State's Blue Cross Net - Part I

Asciscopes Appeals to User Despite High Failure Rate

By Patrick Ward

Of the two cases, COLUMBIA, S.C. - ITT's Asciscopes display terminals have shown a higher than expected failure rate, according to a user here, but he added that the terminals' price/performance combination makes them the best choice for his application.

The user, Marion Kolb, director of telecommunications and control for Blue Cross of South Carolina, pointed to the Asciscopes' ability to operate in block mode, its buffering capability, its built-in modem and acoustic coupler and its \$65/mo cost.

But Replacement Helps

Because of ITT's service by replacement plan, terminal failure has not been that big a problem, Kolb said.

South Carolina Blue Cross leases Asciscopes to about 30 hospitals containing about 65% of the available beds in the state. The hospitals use the terminals to check patient eligibility for Blue Cross, Medicare and Federal Employee Program health care benefits.

The smaller hospitals in the state, for which use of the terminals would be uneconomical,

still mail in their inquiries.

Blue Cross installed the first

User Casebook

five Asciscopes on a trial basis in April and began actual use of the

system in July 1973.

Blue Cross, "at least initially, experienced more failures in the equipment than we felt we should have," Kolb related. "We began putting a great deal of pressure on ITT to improve the situation and I think they re-

sponded well." Quality began to pick up in September, he noted.

The availability of replacement terminals from ITT and its support in that respect "has been tremendous," Kolb remarked. However, ITT does not send the replacement units directly to the hospital but to Blue Cross, and it is left to a Blue Cross representative to replace the disabled unit at the hospital.

But switching the units does not require the services of an electronics engineer, Kolb observed.

The Asciscopes operators in the hospitals depend on the page or block mode in using the terminals, Kolb said.

Users, can key in a full screen of data off-line or make an inquiry that gives them a full screen of data back in response, he mentioned.

By pressing the "send block" key an operator can send up to a 50-character page full of inquiries, or a single inquiry. In the latter case only the end of a between start of text and end of

text characters is transmitted, Kolb said.

The approach of keying in data off-line and sending it in the block or page mode minimizes line time, Kolb pointed out.

If the users in the hospitals could only operate in the character mode, he explained, they would have to call in and be connected to the computer "and so the effective data rate would be only the speed of the operator."

Another strong point of the Asciscopes, according to Kolb, is that it has a built-in modem capable of 300 bit/sec transmission. (An optional; external modem gives the Asciscopes a 2,400 bit/sec capability.)

Using the standard modem "limits us to 300 bit/sec but 300 bit/sec seems sufficient for this particular application," Kolb commented.

Part II focuses on how South Carolina hospitals use the Asciscopes to determine patients' eligibility for Blue Cross and other health care benefits.

Proposed Wats Changes Include Overtime Rate

WASHINGTON, D.C. - AT&T has filed proposed changes to its Wide Area Telecommunications Service (WATS) that would eliminate unlimited use. Under the proposal users with unlimited calling hours per month would have to pay hourly overtime rates for all usage over 240 hr/mo.

The Wats changes are scheduled to take effect on March 6 unless the proposal is suspended by the FCC. In filing the changes, AT&T said it would apply to interstate users who have either Outward or Inward Wats. Among the proposed changes are a reduction in rates to "larger service areas," according to AT&T and an increase in rates to "smaller service areas."

Under the plan proposed to the FCC, Full Period Wats would be called Full Business Day service and would provide calling at a basic rate up to 240 hr/mo. In addition, one-time installation charges would be increased significantly from the present \$10/mo to \$50/mo. When Wats lines are moved to a different location at the same premises, the installation would increase from \$10 to \$25; and when the lines are moved to a new location, the rate would jump from the present \$10 to \$50.

Measured Time Wats would continue to be charged by the hour as it is today although these users would now be entitled to refund allowances for service interruptions of two hours or longer. Previously only Full Period Wats users had this refund allowance.

Another proposed change would eliminate Wats Band 6 so that the full service (cost-to-cost) would combine Bands 5 and 6 into one band called Band 5. Present rates from New York to Los Angeles are \$1,940/mo for unlimited use. This would change to \$1,695/mo for the basic 240 hours, after which the

user would pay \$4.70/hr, AT&T said.

To monitor the hours used by Full Period users, AT&T said it plans to install measuring equipment on those lines at local central offices. Users will be given an accounting of total hours used each month, an AT&T spokesman said.

According to AT&T, there are 25,000 interstate Wats users and 60% of these will get decreases under the proposed changes. The remaining 40% would get increased monthly bills.

'Wats' in Store for Data Customers?

By Ronald A. Frank
Of the CW Staff

The proposed Wats changes filed by AT&T appear to be discriminatory and will penalize a specific type of data communications use.

By limiting Full Period Wats users to 240 hr/mo, AT&T will unfairly single out the high-volume data users who transmit large amounts of data during second and third shifts. Many of these users utilize their Wats lines for voice during the day and switch to data transmissions at night. With an hourly charge on this type of usage, the incentive to stay with Wats service will be greatly diminished for these users.

Another group of data users to suffer are the large polling networks. For maximum monthly usage, AT&T said it would charge overtime rates for calls which average less than one minute duration. This will directly affect CPU sites which dial up a remote terminal location only to be told there is no data ready to send. The one minute per call minimum will be averaged out over the month's usage, AT&T said.

Another group of data users, the large credit authorization networks, characteristically include relatively short inquiry/response sequences. Many of these networks have a high volume of traffic that exceeds 240 hr/mo on each line.

For many of these data users Wats will no longer be an attractive service. The alternative will be either the dial-up network or private line facilities. But in the private-line area, AT&T has also proposed changes concerning its high/low

density plan, recently suspended for 90 days by the FCC.

The long-term goal of AT&T now appears to be geared to forcing data users into its forthcoming Datapoint Digital Service (DDS) for which it has not yet filed proposed rates. Industry sources expect the DDS rates to fall below either the new Wats or high/low private-line rates.

When large proportions of data users is operating on the DDS service, then AT&T will

Analysis

probably ask for significant increases to that service because of higher service costs, industry sources believe.

Again, the Wats proposal seems to discriminate against the networks that have many calls of short duration. Experts believe Bell now feels a call must be of a certain minimum duration to justify the cost of switching the central office equipment to establish the connection.

In addition, Bell is unfairly singling out the data users who transmit data after prime business hours when traffic on the phone net is much lower than during the day.

If these users no longer find Wats rates attractive, they might well eliminate their extra shifts and transmit data during business hours. The net effect of such a shift might unnecessarily increase the amount of daytime traffic on the Bell System network, experts believe.

IEEE Conference On Shortages Set for Feb. 20

WASHINGTON, D.C. - The IEEE is sponsoring a one-day conference on the impact of material and energy shortages on telecommunications growth.

The conference will be held Feb. 20 at the Department of Commerce auditorium, Washington, D.C., and is a follow-on to a similar session held at Neream 73 in Boston.

Shortages' Effects

The conference will discuss the effects of materials and energy shortages and will also consider the potential opportunities. Participants will include suppliers, government representatives, telephone carriers, users and trade association spokesmen.

Further information is available from William Von Alven, Room 522, Federal Communications Commission, 1919 M St., N.W., 20554. Registration fee for the session will be \$10.

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TP Monitor Supports Terminal Nets

NEW YORK — Information Facilities, Inc. has introduced a teleprocessing monitor called Shadow which is said to be comparable to IBM's CICS.

Shadow supports most IBM terminals including the 3270, 2260, 2740, 2741 and 1050 in addition to being compatible with the 3704 and 3705 controllers, a spokesman said. IBM-equivalent terminals such as the

Bunker-Ramo 2200s and Sanders 800 series are also supported by the monitor.

Shadow is said to simplify the writing of terminal-based application systems and it supports local and/or remote terminals interfaced with IBM mainframes operating under DOS, OS and OS/VS. The monitor provides the interface for all terminal activities enabling the programmer to concentrate on the application rather than the communications environment, the company said.

The software system runs under a "software type of virtual storage" that includes paging algorithms, and it can also sup-

port nonteleprocessing tasks. It was developed in England where about 25 users now have it installed.

In an in-house system supporting terminals in local mode, a DOS system with up to 20 3270 CRTs would require about 12K of CPU storage, the spokesman estimated. Monthly leases for Shadow are \$225 for DOS and \$425 for OS and VS versions. Purchase prices are \$8,000 and \$15,000.

Full documentation, training and maintenance support for one year are included. Information Facilities is at 1271 Ave. of the Americas, 10020.

Canadians Study DUV, Coaxial Transmissions

By T.M. Whiteman

Special to Computerworld

OTTAWA, Ont. — Canada's telecommunications industry is actively investigating Data Under Voice (DUV) technology and the use of ultra-high capacity buried coaxial cable.

Bell Canada's Computer Communications Group is looking to DUV as a possible reinforcement to its digital data transmission system Dataroute. "The DUV technique enables us in effect to piggyback streams of data on the lower end of the microwave radio frequency that was unusable until now," a company spokesman said.

"DUV technology allows an additional 1.5 Mbit/sec to be transmitted in association with each radio channel on the existing microwave network in Canada," he said.

DUV technology uses digital multiplexing and regeneration on the long haul network. Work is already under way at the Bell-Northern Research Laboratory here to bring DUV off the drawing board and into reality within the year. Bell experts say DUV will be adequate to handle growth in data traffic in the near future.

Another Bell development which could be ready by 1976 involves the use of an ultra-high capacity buried coaxial cable which will run from Quebec City to Windsor, Ont., across the river from Detroit. This cable is believed to be the first of its size and performance in the world. It is in effect a high capacity information pipeline that will be buried four feet below the surface in a 750-mile long trench.

Communications Week Set

WILMINGTON, Del. — The Communications Systems Management Association has finalized plans for its National Communications Week to be held Feb. 20-22 at the Chase-Park Plaza Hotel, St. Louis.

Among the sessions to be held during the conference is a panel on interconnection which will include Bernard Strassburg, recently retired former chief of the FCC's Common Carrier Bureau; Sang Whang, vice-president of International Communications Corp.; Richard Smith from Illinois Bell; and Thomas Hogan, communications manager at Monsanto.

A session entitled The Impact of the New Common Carriers will feature speakers from specialized carriers, satellite communications carriers, packet switching companies and consultants in the telecommunications area.

Other sessions include a discussion on the consultant's role in communications design and management, and a seminar on the role of technical publications in the communications industry. Information about the conference is available from CSMA at 1102 West St., Suite 1003, 19801.

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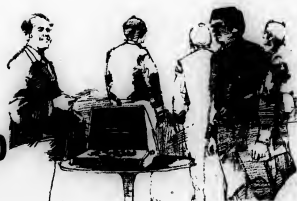
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Channels	5 Slot	x	x	x	x	x	x		
	10 Slot	x	x	x	x	x	x		
	17 Slot	x	x	x	x	x	x		
Features	Battery Backup	x		x		x			
	Automatic Prog. Load	x		x		x			
	Direct Mem. Access	x		x		x			
	Integer MUL/DIV	x		x		x			
	Extended Direct Addressing			x		x			
	Microverification			x		x			
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The Computer Caravan/74 Opens Feb. 20 in D.C.

A rather unusual collection of computer journalists, marketing specialists, salespersons, exhibit specialists and industry observers is finalizing preparations for the 1974 version of the Computer Caravan. The travelling trade show and users' forum, which visited nine cities when it was initiated in 1972 (in the face of industry skepticism), begins its third nationwide tour Feb. 20, in Washington, D.C. Last year, a second Mid-western site was added.

Sponsored by *Computerworld*, this year's Caravan again visits ten cities, with New York as the final stop, April 30-May 2. In between the nation's political capital

Kansas City instead of St. Louis, Dallas instead of Houston, Atlanta or other Southern cities, etc.

The exact rotation is determined by a Kansas advisory panel, comprised of marketing executives from companies in the mainframe, mini, peripheral, and communications industries.

A user program deals with national topics of practical concern to DP managers. Known as the Computer Users' Forum, the program consists of a series of panel discussions and workshops, held by and for users of each region visited by the show.

Besides the exhibit, which includes some 30 companies and the Forum, suppliers offer use seminar rooms to present technical overviews of their products or services. Some companies use invitations, others encourage attendance by the general Caravan audience.

In either case, according to Wilder, the attendee has an opportunity to pose questions of companies' technical and marketing experts who are from the local area, and who will remain in the area long after The Caravan departs.

"By staffing a booth or a seminar room with local people," Wilder says, "a com-

pany isn't likely to give blue-sky promises about non-existent products. A company's Caravan representative is, in most cases, a local salesman or serviceman, who must face the user in the user's own data center," he continues.

Much the same appeal exists in the forum, as many attendees have communicated with CW officials that co-site visits have prolonged, as it were, the impact of the three-day experience.

After our two past Caravan years, including 19 cities, 57 days of exhibits, 81 panel discussions, and 40,000 attendees, who said it couldn't be done?

If there's a theme to The Computer Caravan, it's "information." Oh, the vendors may say it's "selling," and the users may say it's "education."

But no matter what view you have, the overall theme is information, and to that end, there is a central information repository in the exhibit hall: the "Computerbooks" booth.

tal and its corporate capital, The Caravan makes stops in Cincinnati (a first), Houston, Anaheim, San Francisco, St. Louis (another first), Chicago, Boston, and Charlotte, N.C. (still another first).

The marketing philosophy behind the itinerary, according to Neal Wilder, *Computerworld's* vice president for marketing and sales, is to visit the five prime market areas plus the nation's capital, plus four additional markets that can be expected to rotate or alternate.

Thus, future Caravans could return to

Dynamic Caravan Is Expanding Overseas

By Dr. R.R.J. Grosch

CW Editorial Director

Although it is three years old, The Computer Caravan is a new or at least different, kind of computer conference. The exhibits and the exhibitors come to you, in your city or region. The show is dramatic, not static.

In 1973, the very successful domestic Computer Caravan was paralleled by British and German versions, and as this 1974 conference goes on, the first French Caravan is beginning its travels. A Japanese Caravan is planned. One of the most rewarding features of all these conferences, domestic and overseas, is the



Grosch

user interaction. In each city, management and professional people share their experience and their ideas with the attendees. Face-to-face discussions with actual users, coupled with the opportunity to contact the local and national exhibitor people, make the development of your own skills and the solution of your installation's problems practical, rapid, and easy.

Although more visitors attend the ten-city Caravan than go to the huge one-year conferences, each regional show is compact and vital.

Similarly, we attempt in the Forums to offer compact and practical discussions, beginning formally with three problems of major interest but expanding into the sharing sessions into many adjacent areas.

The program is designed to help you get involved—not only to listen and talk with experts, but to contribute your own experiences and help other users develop their skills, while developing your own.

Computerworld, which serves the entire computer community, hopes by sponsoring the Forum to broaden the perspectives of all 1974 Caravan visitors.

Forums Educate On Local User-to-User Basis

The Computer Users' Forum is an integral part of The Computer Caravan because it helps educate users on techniques and/or equipment which can be found in the exhibit area, or which is topical in today's changing computer community.

It educates exclusively on a user-to-user basis, however, as the suppliers have their time in the exhibit area and in seminar rooms provided for their use.

A Computerworld team of five writers and editors, headed by Editor Edward J. Bride, is currently recruiting panel members and workshop leaders for many of the ten cities.

Besides Forum Director Bride, the coordinators are Computer Industry Week Drake Lundell, staff writers Toni Wiseman and Pat Ward, and West Coast Bureau Chief Marvin Smalheiser.

Aside from the normal writing chores, these individuals spend hours each week



Bride

interviewing users who have expressed a desire to participate in a panel discussion or add an idea to the format.

In many cases, users have volunteered their services before being asked. But in any case, a detailed interview on a user's experience with equipment and techniques described on the Forum schedule precedes an official invitation.

A description of a panelist's duties amounts to a description of the entire Forum program.

Morning sessions include a *Computerworld* editorial review on the theme to be followed for most of the day. On the first day in each city, that topic is Source Data Automation; the second day features Data Communications; the third day includes a new topic, Operations Management.

After this CW report, a panel of local users discusses their approaches to solving problems within the day's theme. Questions from the audience follow, after which each of the four users conducts a workshop on a sub-topic within the overall theme.

A luncheon is an integral part of the forum fare, for during this respite a workshop report is given to the audience. The workshops are then repeated after lunch.

Question: Is Today the Threshold?

That question is asked not by Richard A. Kuehn, the speaker on Data Communications, but by *Computerworld*. After reviewing Mr. Kuehn's ideas on Data Communications—part of the Forum program on our second afternoon—we've reached a conclusion that the communications-oriented computer user is experiencing more rapid change than any other type of user.

Richard A. Kuehn describes the chang-

ing DP environment, in terms of the growth of computer usage in the stand-alone and communications environments, and in terms of dollars and units installed. Users may not be increasing their expenditures as rapidly in data transmission as in equipment, owing to new data transmission possibilities.

Similarly, other communications equipment is increasing in sophistication, despite constant or decreasing costs; multiplexers and modems are decreasing in proportion to overall DP expenditures, he suggests.

After this review, Mr. Kuehn addresses relationships in the voice and data communications departments (and functions) in companies, suggesting that a spirit of cooperation must exist if both functions, including data processing, are to perform adequately.

A history of the relationships among data processing, data communications, and voice communications helps illustrate this need and solutions users might implement.

Specific new offerings in the data transmission area are then outlined, with assessments of how each offering might affect computer users.

Will the carriers get into a private rate war? The question is examined on a scientific basis, with the conclusion that—since this is possible—users must remain flexible in as many equipment and data transmission options as possible.

The growth of data communications technology and today's changing environment indicate an instability for users in long-term planning, he suggested.

Users are urged to be prepared to offer some ideas for stabilization.

and attendees choose whether they should return to the workshop, hearing some prepared material repeatedly but taking advantage of the considerable time allotted for question-and-answer, or attending a complete workshop on another subject.

The 1974 Forum also includes the popular "open" sessions following the second workshop time-slot.

For this year, the open sessions again include a tutorial on data communications, given by a prominent independent consultant.

Richard A. Kuehn, president of RAK Associates, Cleveland, discusses near-term data communications projections, including public networks, cost trends, equipment possibilities, and other factors. Consultants users need to be familiar with in planning or improving their networks.

This session follows the panel and workshops on the middle day, thereby presenting communications-oriented users with an entire program on one day.

It is not the purpose of the forum to give a state-of-the-art discussion on DP technology, Bride notes, but to talk about equipment and techniques that are in use or expected shortly.

The schedule holds a lot for the other "open" (no special charge) sessions, the panel discussion on Personnel on the opening day, and the session on Data Base Management, which closes out the Caravan's three-day stay in each location. In every case except for the data communications tutorial, all panel members and workshop leaders are users who have experienced implementation of new equipment or procedures that conform to the topic at hand. This enables the audience to present specific questions; in many cases in the past, it was the informal question periods during lunch or after workshops that gave users an opportunity to learn techniques that could be

(Continued on Page 5f)

SCHEDULE

Washington, D.C.	Feb. 20-22
Cincinnati	Feb. 26-28
Houston	March 5-7
Anaheim	March 19-21
San Francisco	March 26-28
St. Louis	April 3-5
Chicago	April 9-11
Boston	April 15-17
Charlotte	April 23-25
New York	Apr. 30-May 2

The Exposition
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The Forum Topics

First Day:	Source Data Automation Today
Second Day:	Data Communications Update
Third Day:	Operations Management/74

Free Afternoon Sessions

First Day	Personnel
Second Day	Data Communications
Third Day	Data Base Design



The day the uniforms arrived at Fort Custer.

Blame it on the programmer, or maybe an ailing diode. But the last thing you need is an error that makes basic even more of a drag for 5,000 recruits.

What you do need is a way to cut your possibility of error down to an absolute minimum. And the easiest time to start is when you place your next order for computer tape. Just specify BASF.

At BASF, we produce computer tape that's probably a lot better than you'll ever need . . . just in case. For example, our special finishing operation produces a hard, smooth tape surface that's a lot kinder to your tape head, and keeps your maintenance time to a minimum.

One more point. Our tapes don't cost any more than the competition's. You're already paying for

BASF quality . . . you might as well have it. Write today for the complete story of how BASF tapes stack up against the competition. Remember, nobody makes better tape than the people who invented it. BASF Systems, Crosby Drive, Bedford, Mass. 01730.



When it's BASF...you know it's not the tape that goofed.

Caravan Forums Educate Users

(Continued from Page 5/4)

missed at larger, national conferences that feature industry technicians as speakers. Another facet of the Forum program that differentiates it from national conferences is the "on-site" nature of users' presentations. That is, users talk about equipment currently installed, not something that might be six months away.

Forum Format, Content Reflect Changing Needs

Reacting to user needs and reporting on those needs is the function of *Computerworld*, but it also reflects the philosophy behind the Computer Users' Forum.

Consequently, the format and content of this year's Forums have changed from our two previous and successful versions.

- The subject of Data Entry, for example, has been broadened into Source Data Automation of all types, including a Point-Of-Sale data collection and entry.
- Since On-Line data entry often implies data communications, On-Line systems as a forum topic has been added to the middle day, when we talk about communications.

- And decisions on data transmission modes will be included in our network planning workshops.

- The most significant change, described elsewhere, is the addition of Operations Management as a forum topic, and the devoting of an entire workshop to the operational problems of smaller centers.

Afternoon "open" sessions, for which no special admission is charged, have also been changed, with the addition of personnel on the first day and data base management as the final forum topic.

Operations Management a Neglected Area

"Operations Management is one of the most neglected areas of the business."

The DP director is usually the only man who has come out of a programming background and has little management training or a manager who knows little about the unique problems of the DP department."

A computer user was commenting on a "typical" computer shop.

"What is needed is a merging of the two disciplines—either managers who understand systems and computer operations or systems and computer people who understand management principles," he added.

But at the same time, many users are now emphasizing the importance of operations management, particularly in the larger computer centers.

"You can have the latest and best computer in the world in your shop," one user said, "but if your day-to-day management of the system and the people who run it is haphazard, then the system will never perform well, not to mention up to its ultimate capacity."

"We've learned over the past few years that management techniques and the use of such tools as performance monitors can significantly increase the capabilities of our equipment," he said.

"By doing so," he added, "we can go a long way to bringing data processing costs down for the amount of work being performed—and with top management making a closer look at the DP budget than ever before, that can be important to both the company and the department."

During the past two Computer Caravans, users around the nation have requested workshops and panels on one subject more than any other: operations management.

And so this year the third day of The Caravan will include panels and workshops on the subject for the first time. The move is the most significant restructuring of this year's Computer Users' Forum sessions, at least regarding the morning portions.

Operations Management—the day-to-

day discuss approaches that have been proven, rather than untested solutions to unposed or hypothetical questions.

For this reason, users have less reluctance to participate in the panels, and the ensuing workshops have a feeling of being current. Users often serve on panels and lead workshops with four to six weeks' notice, sometimes less, while at many conferences the papers are referred, selected, and "proceedings" are being printed long ahead of this time frame.

"This is not to say that one approach is better than the other," Bride says, "it just illustrates the differences and the validity of both types of conferences," he adds.

"We'd never get in the business of sponsoring national, state-of-the-art conferences. That's the role of the professional, technical societies."

"At *Computerworld*, our role includes commenting on these conferences, as well as educating users on new equipment and techniques that are so often unveiled at many national, regional, international, and even vertical trade shows," he adds.

"In fact, where we observe that a technical or professional society exhibits expertise, we try to make the most of it. Our Forum topics, we often invite societies to co-produce or co-sponsor the Forum sessions."

Many of these societies will also be staffing recruiting tables in the registration lobby of Caravan sites, since this audience is one that is not normally served by many of these groups.

These societies typically recruit from academia or from the technical ranks, and are not served by the user community, the true consumer of their products.

The societies' regional, international, and even vertical trade shows are found in cities where local chapters or regional offices are particularly active.

day-nitgitty of running a computer center—is at the same time both exasperating and not very well understood as a discipline, according to large computer users, since it encompasses almost every discipline from the computer and management fields.

To give it some structure, however, The Caravan Forum will divide the subject into four basic areas: project control, hardware and software performance measurement tools, multivendor installation management problems and small centers.

Project management basically covers the management techniques that are most applicable to developing on-line and off-line systems and other large projects that would commonly occur in a data processing center. These techniques are often borrowed from the general management field, but then radically adapted to the particular environment of the computer room.

The use of performance measurement tools, whether hardware or software, is particularly important to the installation manager since they give him the chance to see clearly where he is going in this system—to discover its strengths and weaknesses.

But there are definite tricks to using these tools to get the maximum advantage from them and descriptions of their use by experienced users can often prevent the less experienced from making early mistakes in their use.

And with more and more users turning to multivendor type of operations due to the use of independently manufactured equipment or of more and more communications for new projects, users of the DP manager faced with several vendors—problems of scheduling maintenance, finger-pointing between vendors' problems arise, and so forth.

And the problem very much the size of the operation that is being managed, since the larger user often has more resources in terms of programmers, systems analysts and budget, and the smaller user who often has to rely on rather limited facilities for major jobs.



The Computer Caravan/74 Exhibitor Product Listings

AMERICAN TELEPHONE & TELEGRAPH COMPANY
680 Fifth Avenue
New York, N.Y. 10019
Tel: (212) 393-3570

The Bell System exhibit will feature the new DATASPEED®40 terminal, the new family of data sets including the Data-phone 4800, 2400 and 1200 and low, medium and high speed facilities for moving data.

ANDERSON JACOBSON, INC.
1065 Morse Avenue
Sunnyvale, Calif. 94086
Tel: (408) 734-4030

Since its beginning in early 1967 as a manufacturer of one of the first acoustic data couplers, Anderson Jacobson, Inc. has continued to develop products for the data communications and computer terminals markets. At the present time the data communications products include a variety of 150 baud, 300 baud, 450 baud modems and acoustic couplers as well as a 1200 baud which is believed to be the only one of its kind in production today. These modems and couplers are available as stand alone units, as building blocks for a multiple modem system or as basic units for OEM applications.

The computer terminal line grew out of an early product wherein an acoustic coupler was designed to become an integral part of a teletypewriter machine. This type of terminal with certain improvements and modifications is still in production today. In addition, an auto-answer version is the AJ841 which is based on a proprietary design that utilizes the heavy duty IBM Selectric mechanism principle. The third basic product of this line is a new model, the AJ830 which is a 30 character per second, non-impact printer terminal.

Anderson Jacobson maintains sales and service offices in principle cities throughout the country.

BASF SYSTEMS
Crooby Drive
Bedford, Mass. 01730
Tel: (617) 271-4000 Ext. 4281

BASF SYSTEMS, the world's leading magnetic media supplier, will display its complete line of computer tape, including the popular BASF/ENDURA and the premium BASF/2000 A.D., as well as its full line of disk packs.

BASF's 2000 A.D. uses a "Higher Endure" Hotter oxide and a thinner, harder coating for those applications requiring premium quality which exceeds industry standards with flawless slitting technique. BASF/ENDURA offers computer users the optimum price/performance at low cost. BASF tapes have been designed to meet not only today's transport requirements, but future 6250 BPI expectations as well. BASF Disk Packs are fully compatible with most major computer equipment. On display will be the 1236 (3336 compatible), the 1112 (2000 tracks per inch 2316), the "Floppy Disk," and a full line of compatible disk packs.

BOEING COMPUTER SERVICES, INC.
P.O. Box 708
Dover, New Jersey 07801
Tel: (201) 361-2121

Boeing Computer Services, Inc. offers a full line of data processing services including Time Sales, Program Services, Data Base Services and Training Services. The BCSNET, a unique network for high-quality, low-error data transmission

over low, medium and high speed lines, will be demonstrated. Unique channel and line testing methods insure consistency and reliability of data transmission.

CALIFORNIA COMPUTER PRODUCTS, INC. (CALCOMP)
2411 W. LaPalma Avenue
Anaheim, Calif. 92801
Tel: (714) 821-2795

CalComp's exhibit reflects the company's leadership in computer graphics and memory systems. Four new systems are being shown:

- 9125/1326 Graphics System—CalComp's new off-line programmable controller with top-of-the-line drum plotter.
- 2100 Alphametric COM System—Fast, low cost COM that handles several programs simultaneously.
- 1030 Disk Storage Facility—IBM 3330 compatible subsystem for System 370.
- 1004A Magnetic Tape System—IBM 3420 compatible subsystem for System 360 & 370.

CENTRONICS DATA COMPUTER CORP.
Hudson, New Hampshire 03051
Tel: (603) 883-0111

Impact Printers/Incremental Keyboard Printers—printers range in speeds from 100 cps to 600 cps, up to 200 psm, 80 or 132 columns, various character sets available up to 128 characters, 5x7 or 9x7 dot matrix, elongated boldface characters (by line or character), prints original and up to four copies. All Centronics printers are plug-to plug and software compatible. Many popular computer and terminal interfaces available.

CINCINNATI MILACRON, Process Control Division
Lebanon, Ohio 45036
Tel: (513) 494-5279

Cincinnati Milacron has a plan...Visitors to The Computer Caravan/74 can see a CIP/2200 disc based computer system running CIMOS-22 (a Cincinnati developed operating system). The disc system will demonstrate business applications using RPG, RJE and BASIC.

Whatever computerization your business requires, try to see you the planning approach that will save you time and money in getting the system on line. They will be there to help you plan your system, to help you select the hardware and software to select, what processing is needed, what hardware and peripherals are best, how to implement the software, whether to lease from them or buy...in short the complete picture for you.

CONTROL DATA CORPORATION
P.O. Box O
Minneapolis, Minn. 55440
Tel: (612) 853-4612

Control Data Corporation's exhibit features OMEGA products, End User products and CYBERNET® Time-Sharing Services. Among the OEM products displayed is a broad array of low cost equipment such as a Flexible Disk Drive, Storage Module Drive, Display Terminal, Non-Impact Printer, Magnetic Tape Transport and Matrix Printer. Core Memory and Disk Pack displays round out the OEM presentation.

End User products include a 370/145 Monolithic Main device, main replacement, and a 3330 Disk Subsystem replacement. KRONOS Time-Sharing capabilities

**Introducing a
Revolutionary
New Product!**

Markette I
Flexible Disc

MEMOREX

Markette I Flexible Disc is more than just compatible with the IBM Diskette System!

The Markette I is directly interchangeable with diskettes used in the IBM 3740 series and comparable flexible disc drives. But the similarity ends there because the Markette I is clearly superior to any other flexible disc. While the mechanical performance characteristics are identical, the Markette I features an advanced oxide coating formulation that is smoother and more uniform. This unique combination—based on extensive research and development—reduces both head wear and surface wear. More than one million passes have been made on Markette I's with no discernible sign of wear.

Memorex first began manufacturing flexible discs as long ago as July 1972. These predecessor discs were made for a non-compatible system using Memorex disc drives. This manufacturing experience was of substantial value in developing the Markette I—the most advanced flexible disc available today.

Before the special coating is applied, in environmentally clean facilities, the tough Mylar* base is subjected to critically exact quality control procedures. The flexible discs are constantly audited, both on-line and off, before being certified for service. The Memorex commitment to memory excellence stands behind every Markette I—your assurance of product superiority.

Space Savers

Each Markette I Flexible Disc has a nominal storage capacity of 1.9 million bits—equivalent to 3,000 80-column punched cards! This frees enormous amounts of work space and storage space. Markettes can be filed in ordinary filing cabinets—no more stacks of bins and trays...no more misfiled cards or spilled trays...no more brittle or moisture-fat cards that can cause processing equipment log jams.

*Mylar is a registered trademark of Du Pont Corporation.

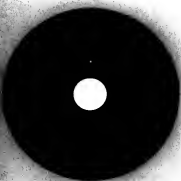
MARKETTE I

Unique Packaging

For user convenience, Markettes are packaged ten to a box. And the sturdy box serves as a free-standing, usable desktop mini-file—which is easy to

stack, store, or ship. The smooth coated flexible disc is contained in a cleaner-lined jacket to form the cartridge which is delivered in protective and removable envelopes.

Envelopes are tabbed for color coding and protrude above the edge of the mini-file box when the top is removed. Each box contains packets of color



The Disc

This is the flexible coated disc that is the heart of the Markette system. The special ferrous oxide coating is applied on both sides to a 100-micron-thick discbase, which is then polished to a smoothness of less than 2 microns (arithmetic average).

Disc Jacket

This component holds the disc in place and is the most important part of each Markette. The discbase is mounted so that the disc is held in place by the discbase and the disc is held in place by the discbase.

The Envelope

This is the outermost component of the Markette system. It is designed to protect the disc and the disc jacket from dust and damage.

MARKETTE

coded labels to identify the data on the Markette. Care and handling instructions are printed on the back of each cartridge-containing envelope.

Because of their unique packaging, Markettes arrive in excellent condition and remain in excellent condition within the working environment. And color

coding facilitates greater efficiency by the user.

MEMOREX
MARKETTE I

MEMOREX
MARKETTE I

MEMOREX
MARKETTE I

EI

Markettes are Mailable

The Markette jacket and envelope are designed to be mailed in specially reinforced mailing containers. Regular envelopes should not be used. Ask your Memorex Representative for details. Just slip the Markette I into the special envelope, affix the addressing label, and it's ready to go!

Improving the Environment

The noise of card punching equipment is one kind of pollution, the paper dust generated by punching is another kind of pollution. The first problem can inhibit staff efficiency, the second can damage sensitive computer equipment. Markette-type systems help improve the data processing environment by minimizing noise pollution and the incidence of free-flying particulates.

Correctable and Reusable

When a mistake is made on a punched card, the card is discarded. When an error is detected on a Markette, it can easily be corrected. When users no longer need the data on punched cards, the cards are discarded. The Markettes can be erased at will and reused again and again.

Price Performance Advantages

By almost any measure, Markettes are one of the most economical portable memory devices ever manufactured. They occupy minimum storage space, can be easily and inexpensively transported, provide random access data, and are both correctable and reusable, and each Markette costs about as much as 7,000 to 8,000 punch cards.

The Extra Ingredients

Memorex is the quality leader in disc drives, disc packs and cartridges; and also in audio, computer and video tape technology. More than a decade of manufacturing skill and experience stand behind every Markette. This team of top professionals is supported by a worldwide network of customer and service representatives—all committed to memory excellence.



with relative humidity from 10% to 90% and wet bulb temperature from 50°F to 100°F. It is not to exceed 100% humidity for 24 hours.

Life
The life of the Markette I is estimated to be 10 years or more. The life of the Markette I is estimated to be 10 years or more.

Dimensions
The Markette I is 10.5 inches high, 10.5 inches wide, and 10.5 inches deep. The Markette I is 10.5 inches high, 10.5 inches wide, and 10.5 inches deep.

Characteristics
The Markette I is a 10.5 inch high, 10.5 inch wide, and 10.5 inch deep. The Markette I is a 10.5 inch high, 10.5 inch wide, and 10.5 inch deep.

with relative humidity from 10% to 90% and wet bulb temperature from 50°F to 100°F. It is not to exceed 100% humidity for 24 hours.

Recording Performance
The Markette I is a 10.5 inch high, 10.5 inch wide, and 10.5 inch deep. The Markette I is a 10.5 inch high, 10.5 inch wide, and 10.5 inch deep.

Track Functions
The Markette I is a 10.5 inch high, 10.5 inch wide, and 10.5 inch deep. The Markette I is a 10.5 inch high, 10.5 inch wide, and 10.5 inch deep.

Each track contains 26 series of characters. The Markette I is a 10.5 inch high, 10.5 inch wide, and 10.5 inch deep.



**MEMOREX
MARKETTE I**

Memorex Corporation

10000 Wilshire Blvd.
Suite 1000
Beverly Hills, CA 90210

(818) 876-1000
Fax: (818) 876-1001

The Computer Caravan/74

Exhibitor Product Listings

within the Cybernet Computer Services Network are demonstrated via a CDC® 713 CRT and Non-Impact Printer. Communications lines link the terminal to CDC's Eastern Cluster Center in Rockville, Md., powered by multiple Control Data® Cyber 70 and 6400 Computer Systems.

COMPUTER DEVICES, INC.

9 Ray Avenue
Burlington, Mass. 01803
Tel: (617) 273-1550

Computer Devices Inc., a TechVen Corporate Partner, manufactures the TELETERM family of lightweight, portable time-sharing terminals and accessories. A 30-CPUS terminal, CDI's 1030 TELETERM is available in a variety of models, including direct TTY-replacement, MULTICS, APL, TSO and IBM-2741 compatible versions.

CDI is introducing the new 3600 Magnetic Tape Cassette Drive. Able to store up to 100,000 ASCII characters, the 3600 MTCD records, reads, transmits and receives at 10-, 15- and 30-cps, selectable from its companion TELETERM. Utilizing standard interchangeable data cassettes, the 3600 needs no electrical outlet and responds to X-on and X-off from any TELETERM.

COMPUTER TRANSCEIVER SYSTEMS, INC.

P.O. Box 15
East 66 Midland Avenue
Paramus, N.J. 07652
Tel: (201) 261-6800

Computer Transceiver Systems Inc. will exhibit its EXECUPORT 300 line of portable 30 cps thermal printers featuring its new multimode keyboard, upper and lower case, and its advanced connector system allowing for the use of up to three peripherals at one time.

They will also be exhibiting their new 110 to 1200 baud asynchronous wire matrix input printer, complete with keyboard, sprocket feed, upper and lower case, vertical, horizontal tabbing, top of form and perforation skip options.

A complete line of peripheral devices will also be shown including their Model 625, 10 to 60 cps paper tape/reader punch and their Model 420, 110 to 1200 baud tape cassette device.

COOKE ENGINEERING COMPANY

900 Slaters Lane
Alexandria, Va. 22314
Tel: (703) 548-3589

On display at the Cooke exhibit will be a complete line of E.I.A. Data Patching Equipment for rerouting entire full duplex Digital Data Circuits with a single

patch. Permits monitoring and testing without interrupting on line traffic. This equipment provides 100% flexibility in interconnection of Digital Circuits between Data Terminal and Data Communications Equipments.

E.I.A. Data Switching Modules: For switching Digital Data Circuits singly or simultaneously in groups of sixteen between Fcps or Computer Ports and on line to standby modes or terminals. Permits entering on line circuits for monitoring or testing.

Cosial and Twinaxial Patchfields: For patching balanced or unbalanced circuitry.

CULLINANE CORPORATION

One Boston Place
Boston, Mass. 02108
Tel: (617) 742-8656

Cullinane Corporation will feature at The Computer Caravan its Integrated Data Base Management System (IDMS). IDMS is the only system designed to meet a subset of Codasyl Data Base Task Group Language Specifications available on IBM and Univac Spectra equipment. In addition, IDMS has outstanding information retrieval capabilities based on the Cullinane Corporation's Culprist system including EDP-Auditor, Personnel-EDP-Reporter, Market-EDP-Analyzer, etc. A seminar on the IDMS system will be held during each show. Participants in the seminars will be able to attend The Computer Caravan free of charge at guests of the Cullinane Corporation.

Those wishing additional information may contact the Cullinane Corporation at its booth or by calling (617) 742-8656.

DATA GENERAL CORPORATION

Route 9
Southboro, Mass. 01772
Tel: (617) 485-9100

Data General Corporation will feature a Dual Processor/Shared Disc system under the control of the Real Time Disc Operating System. This is ideal for the high system availability and/or load sharing requirements commonly encountered in instrumentation, process monitoring and control, and communication applications.

DATAGRAPHIX

P.O. Box 2449
San Diego, Calif. 92112
Tel: (714) 283-1038

Datagraphix is exhibiting a Model 130 of fine COM recorder from its latest series of Computer-Output Recorder-2222 recorders called System 4500. Other models included in the System 4500 series are: Model 120 - Online COM recorder and Model 150 - Offline COM recorder with a mini-front end. System

4500 is a modular unit allowing expanded capabilities as the user's needs grow. Each of the models incorporate features aimed at ease of operation, high quality output and low maintenance.

DECISION INC.

5601 College Avenue
Oakland, Calif. 94618
Tel: (415) 654-8626

Decision manufactures optical data entry systems and mini-peripheral products for Nova-line mainframes. At their booth will be a complete phase-encoded type controller/formatter on a single 15" board, a floppy disk system with a DOS offering IBM compatibility, a complete disk-based computer system for under \$12,000, and the OMR 6500 Optical Mark Page Reader.

Decision has started deliveries on the OCR 7600 Optical Character Recognition System. They would be pleased to discuss the characteristics of this low-cost multifunction system with you at their booth.

For over four years, Decision has supplied its products to both the OEM and End-User marketplace. They have supplied controllers, peripheral systems, turn-key computer systems, optical mark page readers, and optical character recognition systems in single and large quantities. If you have, or contemplate, a need for these products, go see them - they might have what you need.

DELTA DATA SYSTEMS CORPORATION

Woodhaven Industrial Park
Cornwells Heights, Pa. 19020
Tel: (215) 639-9400

DELTA will exhibit a Video Display Terminal System which includes a terminal with special function keyboard, a cassette recorder, and a line printer. The company will also show the DELTA 5000/APL Video Display Terminal that offers switch selection of either upper/lower case Ascii or APL characters, plus overstrike capability. Scheduled for introduction at this year's Caravan, will be a low cost version of the company's standard DELTA 5200 terminal. The new model is designated the DELTA 5500, and will be available for delivery starting June 1974. Other DELTA products at the Caravan will include a standard DELTA 5000 Series Video Display Terminal, and a Multiterm Programmable Terminal Multiplexer.

DIGITAL EQUIPMENT CORPORATION

146 Main Street
Maynard, Mass. 01754
Tel: (617) 897-5111 Ext. 2046

Digital will exhibit data communications and business data processing systems. The data communications demo will consist of a PDP-11 DOS/COMTEK (Communi-

cation Multi-terminal Executive) System. Supported by a PDP-11/10 processor, 16K words of core memory, RK05 disk cartridge system, L511 line printer and several VT05 display terminals, DOS/COMTEK software can be used in such applications as message switching and remote processing. The business processing exhibit will feature the DEC DATASYSTEM 500. It is based on a powerful PDP-11/40 with a 96K byte memory system, two cartridge disk drives, line printer, DECwriter terminal and two video display terminals. Its commercial timesharing, resource sharing, disk resident software features the BASIC PLUS programming language.

ELECTRONIC MEMORIES & MAGNETICS - Computer Products

12621 Chadron Avenue
Hawthorne, Calif. 90250
Tel: (213) 675-1107

EMM Processor Storage Systems. Interfaces with System/360 and System/370 computers. Storage capacity: 16,384 to 4,194,304 bytes of data and 16,384 to 2,500 records to 2.5 microsecond. Monolithic 7370/145 Multimeter. All required CPU features including error correction provided by EMM.

Celcus, CMI, CMIII, CMVI, CMXI and CMXX Disk Packs & Cartridges. Compatible with IBM 2315, 5440, 1316, 2316, and 3336 disk products.

GENERAL COMPUTER SYSTEMS INC.

P.O. Box 6251
Dallas, Texas. 75222
Tel: (214) 242-8411

On-line application of the multifunction GCS 2100 will demonstrate source data entry, word processing, and touch tone data input.

Data Text - Word processing with the GCS 2100 provides capabilities for transferring original dictation, as well as form letters on either a single copy, high quality printer or a multicolor high-speed printer.

DataTone - Touch tone input to the GCS 2100 provides source data entry for order entry, business accounting, and industrial automation. Touch tone with operator interrupt capabilities will be demonstrated, converting numeric input to alphanumeric data.

DataTerminals - Local or remote data entry with tutorial prompting and the GCS macrolibrary will demonstrate the power and flexibility of the GCS 2100 system.

GOULD, INC., Data Systems Division

29 Orleans Road
Newton, Mass. 02164
Tel: (617) 969-6510

Two new Gould electrostatic printer/

MANAGE
PROJECTS
EASIER

☐ Albany-3/27
☐ Arizona-2/20
☐ Baltimore-2/19
☐ Birmingham-3/20
☐ Boston-3/12
☐ Bridgeport-3/8
☐ Buffalo-3/19
☐ Charlotte-2/19
☐ Chicago-2/15
☐ Cincinnati-4/3
☐ Cleveland-4/2
☐ Dallas-2/27
☐ Denver-3/27
☐ Des Moines-3/5
☐ Detroit-2/19
☐ Hartford-3/5
☐ Houston-2/26
☐ Indianapolis-4/9
☐ Jacksonville-4/2
☐ Kansas City-3/12
☐ Los Angeles-2/13
☐ Los Angeles-3/12
☐ Lincoln-3/12
☐ Louisville-4/10
☐ Miami-4/4
☐ Milwaukee-2/14
☐ Minneapolis/St. Paul-3/8
☐ New Orleans-3/21
☐ New York City-2/12
☐ Oklahoma City-3/28
☐ Omaha-3/19
☐ Ottawa-2/26

☐ Philadelphia-2/13
☐ Phoenix-3/5
☐ Pittsburgh-2/26
☐ Portland, Me.-3/13
☐ Portland, Ore.-3/27
☐ Richmond-2/27
☐ Rochester-3/20
☐ St. Louis-3/13
☐ San Diego-3/6
☐ San Francisco-2/12
☐ San Francisco-3/13
☐ Seattle-3/26
☐ Syracuse-3/28
☐ Tampa-4/3
☐ Toronto-2/20
☐ Vancouver-3/28
☐ Wash. D.C.-2/20

Contact: Robert P. Wolk, V.P.

Atlantic Software Inc.

Lafayette Building, 5th & Chestnut Sts.
Philadelphia, Pa. 19106-216-922-7500

☐ Please send us literature about PROJECT CONTROL/70
☐ I wish to attend the seminar noted. Send me further details

Name _____

Title _____

Company _____

Address _____

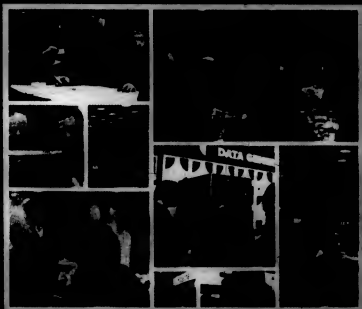
City _____

State _____

Zip _____

Telephone (_____) _____

Don't wait till the last minute. Now's the time to make sure your schedule includes a visit to the computer show that has already benefited more than 40,000 computer users in its first two years. Here are some of the details of our updated '74 program.



THE FORUMS user-to-user in '74

The Computer Users' Forums give you a unique opportunity to exchange information with other users and independent experts about current practical problems. Forums run from 9:00 A.M. to 2:30 P.M. each day, including an opening report, panel discussions, morning and afternoon workshops and luncheon. If you register in advance for the User-to-User Forums, you'll save \$5 per day from the price at the door. If you attend all three days, you'll save \$15, just for acting early. (Note that no advance registration is required if you attend the Exposition only.)

Here are the Forum topics for '74

- First Day** **Source Data Automation Today**
with workshops on
Point-of-sale, Intelligent Terminals,
Optical Scanning and Off-Line Key Entry
- Second Day** **Data Communications Update**
with workshops on
Network Planning, Front-End Processors,
On-Line Systems and Equipment Selection
- Third Day** **Operations Management**
with workshops on
Performance Measurement, Project Control,
Multi-Vendor Installations and Small Centers

Free afternoon sessions

Each day an important, current topic is discussed in an open afternoon session at 2:45 P.M. — free to all Caravan attendees. In 1974 we'll be looking at:

- FIRST DAY — Personnel
SECOND DAY — Data Communications
THIRD DAY — Data Base Design

THE EXPOSITION a business show, not show business

From 10 A.M. to 6 P.M. each day, you'll have a unique chance to see and compare the latest EDP equipment and services in a pleasant, uncrowded exhibit hall. You'll see everything from complete systems, to independent peripherals, to software to terminals. And you'll be able to talk specifics about your problems and needs with knowledgeable representatives of leading EDP companies. Because The Caravan has a total of 30 show days in ten cities, no one day is too crowded. The whole Exposition is designed to let you get the facts you want from the people you want to see. And the people you want to see will be there. Here's a partial list of the companies that we'll be keeping on our '74 tour:

American Telephone & Telegraph Company • Anderson Jacobson, Inc. • Auerbach • BASF Systems • Boeing Computer Services, Inc. • California Computer Products, Inc. • Centronics Data Computer Corporation • Cincinnati Milacron • Compalco, Inc. • Computer Devices, Inc. • Computer Transceiver Systems, Inc. • Control Data Corporation • Cullinane Corporation • Data General Corporation • Decision, Inc. • Delta Data Systems Corporation • Digital Equipment Corporation • Electronic Memories & Magnetics Corporation • General Computer Systems, Inc. • Gould, Inc., Data Systems Division • Hazeltine Corporation • Hewlett-Packard Company • Incoterm Corporation • Interdata, Inc. • Intertek • International Communications Corporation, a Milgo Company • Jomec, Inc. • Lockheed Electronics Company • Modular Computer Systems • MSI Data Corporation • Pensoph Systems, Inc. • Perini Data Communications, Inc. • Perics Corporation • Prime Computer, Inc. • Quantum Corporation • Raytheon Data Systems • Raytheon Services • Scope Data, Inc. • Shugart Associates • Stromberg Data-graphix, Inc. • Syco, Inc. • Texas Instruments, Inc. • University Computing Company • Western Union Data Services Company

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If you'd like to attend The Computers Users' Forums, just fill out the registration form and send it in as soon as possible. Remember, advance registration for the Forums saves you \$5 per day. If you wish to attend only the Exposition, no advance registration is required. Just mark your calendar for the city and dates you want to attend and come to the location indicated in the complete schedule.

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My check or purchase order is enclosed. (Advance registration is required for the Exposition only.)

Name _____

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Photocopy one number to each company on this sheet before you.

01. Source Data Automation Today	04. Data Processing	10. Federal, State and Local Government	02. Data Processing
02. Data Communications Update	05. Data Processing	11. Financial Institutions	03. Data Processing
03. Operations Management	06. Data Processing	12. Insurance	04. Data Processing
04. Data Base Design	07. Data Processing	13. Manufacturing	05. Data Processing
05. Data Communications Update	08. Data Processing	14. Retail	06. Data Processing
06. Data Base Design	09. Data Processing	15. Transportation	07. Data Processing
07. Data Communications Update	10. Data Processing	16. Utilities	08. Data Processing
08. Data Base Design	11. Data Processing	17. Other	09. Data Processing
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99. Data Communications Update			100. Data Processing
100. Data Base Design			

Exhibitor Product Listings

The Computer Caravan/74

plotters are featured. The Gould 5000, designed expressly for minicomputers, has a price/performance ratio superior to competitive products. The Gould 5000 prints 132 columns of 64 Ascii characters at 1600 lines per minute. This means you get high speed for maximum mini throughput efficiency. The Gould 5100 prints and plots data on over 21 inches of 22 inch wide paper - widest electrostatic plotter in the industry. Designed for scientific and engineering applications, the Gould 5100 is ideal for seismographic charts and A to D size drawings. Both units have direct on line interfaces to all popular minicomputers and the IBM System 360/370. Gould software is the most efficient and flexible available anywhere. Special software packages are available for scientific, engineering and business graphics. Built with traditional Gould quality and backed by Gould's own reliable, nationwide service organization, Gould printer/plotters are your best buy on the market.

HEWLETT-PACKARD 11000 Wolfe Road Cupertino, Calif. 95014 Tel: (408) 257-7000

Hewlett-Packard is featuring their micro-programmable minicomputers and systems. Seminars on microprogramming will be offered. Learn how you can enter the age of microprogramming with the most complete hardware-software microprogramming package now offered.

HP also has for you full information on their scientific and computational computer systems. Minicomputer processors with wide selection of mass storage devices as presented in new low cost configurations.

INCOTERM CORP. 6 Strathmore Road Natick, Mass. 01760 Tel: (617) 655-6100

INCOTERM Corporation is displaying a new clustered communications terminal, a new data entry system including their SPD 10/20 Intelligent Terminal with a dual diskette and the 900 series Remote Batch Terminal.

The new clustered terminal is offered in two configurations designated the SPD 20/20 system offering full programmability and the SPD 300 System offering 3270 emulation.

And SPD 10/20 combined with the recently announced SPD-D-250 Diskette will be used to demonstrate Incoterm's new Disk Operating System and Data Entry functions on the SPD 10/20.

The series 900 Remote Batch Terminal offers compatibility with IBM 2780 and 360, Univac 1004, CDC User 200, 360/20 HASP and ICL 7020.

INTERDATA INC. Two Crescent Place Oceanport, N.J. 07757 Tel: (201) 229-40-00

Model 7/32: A 32-bit minicomputer that can directly address up to 16 million bytes of main memory and sells for under \$10,000.

Model 7/16: An OEM 16-bit minicomputer that sells for \$3,200 that can be field expanded all the way up to the 7/32.

A complete line of software that includes 32 bit single and multi-user operating systems, 16-bit operating systems, single and multi-user Basic, Fortran V, a common assembly language, a communications executive, etc.

INTERNATIONAL COMMUNICATIONS CORPORATION, A Milgo Company 7620 N.W. 36th Avenue Miami, Florida 33147 Tel: (305) 691-1120

ICC/MILGO will display a complete line of data communication products, featuring high-speed modems for data transmission over dial-up phone lines or leased data lines. Modems from ICC operate at data rates from 2400 bits-per-second to 9600 bits-per-second plus ultra-high-speed transmission for limited distance communication. The ICC display will also include data communication test equipment and accessories. Experienced personnel will be in attendance for consultation.

INTERTEC, INC. 6 Vine Brook Park Burlington, Mass. 01803 Tel: (617) 273-0950, Ext. 67

Intertec will demonstrate data communication systems that can eliminate up to 80% of network downtime; save money and time by eliminating false service calls and fingerpointing among vendor service organizations; help configure networks flexibly, to match development requirements; guarantee operations at critical sites in the network; and help data communication managers get a better overview and better control of their networks. Equipment shown will include modems, network configuration and backup equipment, and their new MPT500 Multipoint Tester, a comprehensive diagnostic center for communication networks.

INCOTERM, INC. 3300 Scott Blvd. Santa Clara, Calif. 95050 Tel: (408) 246-2950

INCOTERM Inc. will display mini-computer peripherals that represent the broadest product line available from an independent manufacturer. They include 200 TPI

disc drive, cartridge and reel-to-reel magnetic tape drives, a complete line of paper tape equipment, card readers, line printers, controllers and adapters. All backed by operating systems that interface with most popular mini-computers and by nationwide custom engineering. The IOMEC data entry and communications system will be demonstrated by Porta-Writer Model 40, a portable low-cost data entry terminal that gathers data in the field and transmits by phone to your processing center.

LOCKHEED ELECTRONICS COMPANY, INC., Data Products Division 6201 E. Randolph Street Los Angeles, Calif. 90040 Tel: (213) 722-6810

The Lockheed System III is an integrated configuration of minicomputer hardware and software which is compatible with existing IBM System/3 source-level RPG II programs.

The basic Lockheed System III includes a decimal CPU, 16K bytes of core memory, a 5-million-byte disc drive, CRT, Keyboard/Console, and line printer. System flexibility provides for expansion to 64K bytes, up to four 5440 type disc drives, high performance printers, magnetic tape, and card equipment.

System software - which includes DOS, file management, sort/merge, and utilities - is in the form of an integrated package which will support application programs written in either RPG II or assembly language.

Lockheed's System III is ideally suited for companies having the capability to market a complete turn-key application package to their own customers. Utilizing Lockheed Electronics' computer system and maintenance as a base, the sophisticated systems/software organization can now provide total operational support for their clients by adding commercial end-user software.

MODULAR COMPUTER SYSTEMS, INC. 1650 West McNab Road Fl. Lauderdale, Fla. 33309 Tel: (305) 974-1386

Modular Computer Systems, Inc., will display a MODCOMP II computer system in operation demonstrating the MAX III real time executive capabilities and data communications capabilities. Emphasis will be on ModComp's family of computers providing all the tools required by the user to serve his measurement, control, communications and information processing problems.

MSI DATA CORPORATION 540 Fischer Avenue Costa Mesa, Calif. 92627 Tel: (714) 540-6600

MSI Data Corporation, having installed over 20,000 Portable Data Entry Terminals, will demonstrate its full line of terminal products.

SOURCE 1100 - This is a light weight, battery operated portable data entry terminal which has a solid state memory for collecting data. Information may then be transmitted over ordinary telephone lines.

SOURCE 2000 - This series of portable data entry terminals provides alpha and numeric data entry on cassette with a variety of display options.

SOURCE 2100 - A 250,000 character cassette provides means of capturing source data in remote field locations. The portable terminal allows for recall of the last three entries and transmits at 120 cps over standard telephone lines. Other options such as check digit and polling will be shown.

MSI's family of communications receivers for on-line or off-line data recording will be shown including the Data System IV. This may be a single line receiver or be field upgraded to a remote batch terminal supporting portable field data entry devices and allowing high speed communications to a central computing facility.

OMNITEC CORP. 2405 S. 20th Street Phoenix, Arizona 85034 Tel: (602) 258-8246

OMNITEC - one of the oldest and most respected names in acoustic couplers and modems, offering the standard 700 series for time-sharing and message communication application and the 4,000 series for CBT or CBS line coupling, auto answer, manual originate modems.

Their new 501A, low cost unit designed to interface with any standard model 33 Teletype for simulating application. All the reliability of the OMNITEC name in an inexpensive model.

The new 4500 Omni-Dat-X modem, designed to replace model 3110 (10C with full TWIX functions). Can be switched between TWIX network and a standard Bell DAA interface.

Reliability, profitability, diverse application, low cost - the OMNITEC line of couplers and modems.

PANSOPHIC SYSTEMS INC. 1211 W. 22nd Street Oakbrook, Illinois 60521 Tel: (312) 325-9600

PANVALET, The Program Management and Security System: Eliminate card handling; increase CPU throughput; document library changes; provide library statistics; prevent program tampering; protect production programs; merge back-up files; create complete back-up; protect against DASP error; and compress for efficiency. Plus, TSO command processor and Source code now available as options.

EASYTRIEVE, The File Management and Retrieval System: Easy to learn and use; written in English; no formal coding; no compile time or testing; runs at I/O speeds; and flexible report generation.

PENRIL DATA COMMUNICATIONS, INC. 5520 Randolph Road Rockville, Md. 20852 Tel: (301) 881-8151

Penril will be displaying a number of high performance, low cost data communications products including the popular TLA-3000 voice channel test set. A complete line of data modems operating between 0 bps and 4800 bps and DDD applications will be featured. The capabilities of the TLA-3000 will be demonstrated showing how this dynamic test instrument can be highly effective in isolating communication link problems.

PERTEC 6000 Ironton Avenue Chatsworth, Calif. 91311 Tel: (213) 882-0030

The Pertec System 1300 - a versatile and dynamic system that can be used as a remote batch terminal; for remote job entry; for source data entry; for data communications; for data conversion; and for data output.

On display will be the 1311 Data Terminal - a IBM-compatible key/tape terminal that can read/write, send/receive in recording densities of 200, 556, 800 cpi on 7-track tape; 800 cpi on 9-track phase-encoded in EBCDIC or ASCII code at 124 ips.

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Come to the national computer conference that's coming to you, and forget about the hassle of long trips during an ever-tightening energy shortage.

The Computer Caravan's unique system of regionalization saves you time and trouble, because the vast majority of U.S. computer users are within easy commuting distance of one of our ten stops. More than 40,000 computer users took advantage of this convenience and attended the Caravan during our first two years. With fuel supplies tight and airline travel restricted, we expect even better attendance at our '74 program. But convenience isn't the only thing that makes the Computer Caravan unique. You won't find our user-oriented forums, workshops and open sessions at any other computer show. You'll have a chance to discuss practical solutions to current EDP problems with other users and independent experts. You'll listen, talk and learn. Then you'll see the latest EDP equipment and services from as wide variety of leading EDP companies at our expanded Exposition. Some of the companies we'll be keeping are listed below, and we think you'll agree that it's an impressive group.

The Computer Caravan.

It's the computer users' forum and exposition, and it's coming to a city near you. If you're a computer user, you should be there. And if you're a computer marketer, your products or services should be on display. Booth space is limited, but it's not too late to act. Call Neil Wilder or Dottie Travis at (617) 965-5800 for all the details. We're the only computer show that gives you truly national coverage and we've got the facts (and the sales figures) to prove it. They're yours for the calling.

The Computer Caravan/74

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- Auerbach
- BASF Systems
- Boeing Computer Services, Inc.
- California Computer Products, Inc.
- Cincinnati Milacron
- Complanco, Inc.
- Computer Devices, Inc.
- Computer Transceiver Systems, Inc.
- Control Data Corporation
- Cullinane Corporation
- Data General Corporation
- Delta Data Systems Corporation
- Digital Equipment Corporation
- Electronic Memories & Magnetics Corporation
- General Computer Systems, Inc.
- Gould Data Systems
- Hazeltine Corporation
- Hewlett-Packard Company
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- Lockheed Electronics Company
- Modular Computer Systems
- MSI Data Corporation
- Pansophic Systems, Inc.
- Penril Data Communications, Inc.
- Perier
- Prime Computer, Inc.
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- Raytheon Data Systems
- Scope Data, Inc.
- Shugart Associates
- Stromberg Datagraphix, Inc.
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- Texas Instruments, Inc.
- University Computing Company
- Western Union Data Services Company

The Computer Caravan regional computer users' forum and exposition.

Exhibitor Product Listings

The Computer Caravan/74

1351 Printer - a 100 line per minute impact printer; 128 character set; accepts up to 75,000 cps.

1317 Paper Tape Reader - for conversion of paper tape to magnetic tape; operates at 300 cps.

1331 Punch Card Reader - converts 80 or 96 column cards to magnetic tape at 300 cards per minute.

PRIME COMPUTER, INC.
23 Stratmore Road
Natick, Mass. 01740
Tel: (617) 655-6999

Prime has a plan - the Prime Computer User Plan. It's a totally new way to buy, use and upgrade computer systems. Highlights of the plan include a two-year guaranteed trade-in allowance for upgrading central processors and memories, upward and downward software compatibility among all computers in the line, elimination of arbitrary configuration restrictions, choice of three discount purchase plans and a unique ASR-Sp program for efficient, low-cost repair of faulty circuit boards. Many of the plans' features will be demonstrated on a Prime 300 system with virtual memory.

SCOPE DATA INC.
3728 Silver Star Road
Orlando, Fla. 32808
Tel: (305) 298-0500

Scope Data Inc., a subsidiary of Scope Incorporated, Reston, Virginia, will be demonstrating the KSR and R/O models of the Series 200 non-impact printers.

The Series 200 printers are uniquely constructed with plug-in modules.

Optional features via plug-in modules:

- Ease of maintenance swap-out via plug-in modules.

- Latest engineering changes and updates via plug-in modules.
- Downtime reduced drastically via plug-in modules.

This low cost, high speed printer comes with a 15 month warranty, 120 characters per second speed capability, and is supported with a 24 hour Scopeplex module swap-out program and a multi-service maintenance plan.

An optional plug-in speed module allows data to be printed at rates up to 2400 baud and a throughput of 1200 baud.

The Series 200 printer provides a 7x9 matrix, 96 character font, with upper and lower case characters. An optional plug-in dual character generator allows the use of two character sets in the same machine for special applications.

A quality archival image is provided on electro-sensitive paper costing less than 2 cents per page. No ribbons, ink, toner, etc. are required.

Not only can the Series 200 non-impact printer replace lower-speed daisy-wheel, heavy-duty typewriters, and other lower-speed impact printing mechanisms for mini-computers, but they can reduce more expensive low volume/low speed line printers. Additional application areas include off-line print station, hard copy for CRT's, and input/output printing terminals for commercial and government communication networks.

SOFTWARE SCIENCES CORP.
888 Seventh Avenue
New York, N.Y. 10019
Tel: (212) 489-7880

Features nationally used training and evaluation techniques for improving productivity of analysts, programmers and operators. Includes complete library of validated test, called SCOPE, which measures a person's knowledge in efficiency

using System 360/370. SCOPE results pinpoint what each person knows best, and critical areas where his knowledge needs strengthening. With 25 different tests, each user tailors evaluation to the languages, operating systems, debugging and hardware of his own installation. Follow-up training based on SCOPE results provided through SSC's System 360/370 Education Program of some 150 courses for all levels of DP personnel.

SYCOR, INC.
100 Phoenix Drive
Ann Arbor, Mich. 48104
Tel: (313) 971-4900

Sycor presents intelligent answers to low-cost data entry - the Model 340 for IBM 2780-compatible large scale remote job entry and error free data collection, and the Sycor 250 intelligent display system for IBM 3270-compatible on-line applications.

The Model 340 RJIS configuration is equipped with a high-speed card reader, 300 lpm printer and binary synchronous communications. In a separate Model 340 branch office environment, the terminal will demonstrate its unique error-free data entry capabilities.

The Sycor 250 system - remote display stations, stand-alone terminals and printers - features user-programmable intelligence at the source, as well as dual-tractor 80 and 165 cps matrix printers.

TEXAS INSTRUMENTS, INC.
Box 1444
Houston, Texas 77001
Tel: (713) 777-1301

The Texas Instrument demonstration features a 980A computer system and data terminals. The 980A computer system is comprised of the high-performance 980A Mini-Computer, a moving head disc, a

"Silent 700" ASR terminal, and a 912 video display terminal. The 980A is a general purpose computer with up to 65K of 750-nsec MOS memory and many built-in standard features. The 980A has software to support a variety of applications. Multi-user basic, used in this demonstration, will support up to eight users simultaneously on either 733 ASRs, 733 KSRs, TTYs or displays.

The "Silent 700" ASRs feature non-impact printing, simultaneous transmit and receive, twin magnetic tape cassettes, and plug-in circuitry. Also on demonstration is a 725 portable data terminal that makes your computer as close as a phone.

The 912 Video Display Terminal (VDT) is a desk-top model offering a 1920-character 12-inch diagonal screen and a built-in MOS random access memory.

WESTERN UNION DATA SERVICES COMPANY
70 McKee Drive
Mahwah, N.J. 07430
Tel: (201) 529-1170

Western Union Data Services Company is a nationwide sales and service organization in the data/communication terminal field. Visitors can view our leased terminals for interactive, data collection, and remote batch applications. The highlights will be the EDT 300 and EDT 1200 terminals with cassettes designed to fit any network at line speeds of 110, 300 and 1200 baud.

The following companies are also exhibiting, but product descriptions were not available in time to be included: Auerbach Publishers Inc., Beehive Medical Electronics, General Automation Inc., Quantor Corp., Shugart Associates, and Raytheon Data Systems.

You'll be in good company at La Caravane Informatique.

The travelling computer users forum and exposition will tour Europe's second largest computer market starting next February in Lyon. And several excellent companies have already reserved one or more booths for the exposition. We'd like to welcome them.

The French Computer Caravan also has an excellent name as co-sponsor - *Zero-Un-Informatique*, a leading computer industry publisher of both a weekly newspaper and a monthly magazine. *Zero-Un-Informatique* will provide local identification and promotion, and will assure that La Caravane Informatique is responsive to the current needs of French computer users, with locally run forums, workshops and seminars.

If you're marketing in the rapidly growing French computer market or if you want to be - La Caravane Informatique is a selling tool you shouldn't pass up. Here's the schedule:

Date	City	Site
February 26-28	Lyon	Palais de Congres
March 5-7	Marseille	Palais de Congres
March 12-14	Bordeaux	Fora Internationale
March 19-21	Nantes	Fora de Exposition
March 24	Lille	Palais de Expositions
April 2-4	Nancy	Palais de Expositions

If you'd like more information, just send in the coupon. Or call Neal Wilder at (617) 965-5800.

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Neal Wilder
Vice President, Marketing
Computerworld
797 Washington Street
Newton, Mass. 02160

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A Look at a Turnkey System—Part III

2 Wires Link I/O Units

By Vic Farnen
Of the CW Staff

CORPUS CHRISTI, Texas — It's not easy to drive a peripheral I/O device up to 2,500 feet from a computer, but that was one problem that had to be faced at Memorial Medical Center, a 500-bed hospital, when it installed its data entry system and administrative message system.

"There just couldn't any peripherals or driving equipment that could drive a signal 1,000, 2,000 or even 3,000 feet in the electrical noise that hospital equipment generates," according to Peter Berkowitz, vice-president of engineering and systems at Automated Systems Corp. (ASC), the firm hired to do the job.

"In addition, the hospital wanted to use cards to input data and Ascii code for transmitting to the CPU, so we had to match the speed of reading the cards—in Hollerith format—to line speed as well as matching up printer speeds for the NCR thermal printers," he said.

DLDR Hears SOS

ASC looked at various methods of transmitting data back and forth in serial format and finally decided a differential line driver/receiver (DLDR) was best. "Conventional systems, even including modems, are susceptible to noise and variations from electrical noise."

"In a 2-wire paired transmission, if there is a noise spike, the reference level goes up equal to the data line spike and the result is common mode rejection," Berkowitz said.

"There were no DLDRs for the RS232 interface for the NCR printers, Printec printers and the HP card readers, so we had to build our own to attach to each I/O device," he added. At the other end, at the multiplexer, instead of using RS232 interfaces, "we used DLDRs again—this gave us the capability to run up to nearly 5,000 feet just using 2-wire-pair lines with DLDRs on each end, even over on several of the long runs through the real noisy areas we opted for shielded 2-wire pair," Berkowitz said.

The DLDRs were relatively inexpensive, and were built on a small board which robbed its power from the I/O device.



At each nurse's station is an NCR 260 thermal printer and a Hewlett-Packard card reader, each of which can operate independently. The card reader serves as the data input device to order services and medicines, and the printer provides each station with schedules and administrative instructions.

ASC did have a problem with the NCR thermal printers after they were installed—they couldn't operate continuously, and so several Printec terminal printers were added in the busy areas.

But the hospital isn't satisfied yet. The Printec printers under, the heavy usage are often down for repair and maintenance. The hospital is actively looking for a replacement (about 40 units) of a printer that will give three copies quietly, and provide a positive answerback at about the same cost as the NCR 260s.

Explorer Troop Saves \$5,000

Although it may be hard to believe, the hospital saved nearly \$5,000 when the local Explorer Troop, with the help of John Collins, the hospital's electronics technician and his adviser, volunteered to run the miles of wires through the conduits throughout the hospital. Depending on whom you listen to, this volunteer crew either did a great job, or "screwed everything up." Considering a few mixed-up terminations, as the major snafu, however, probably would have been paid for the course no matter who ran the wiring—and the hospital did save enough to make the operation "well worth it."

Datapro Reports Users Happy With Add-On Memory

DEL RAN, N.J. — Users of add-on main memory units from independent suppliers are generally pleased with their performance and reliability, but many users have encountered problems in the installation and/or maintenance of these devices.

These are key findings of a user survey reported in "How to Select and Use Add-On Main Memory," a 12-page report available from Datapro Research Corp. for \$10 per copy.

The ratings assigned by 143 responding users with a total of 175 installed add-on memory units can be combined to form the following profile of overall user satisfaction:

	Excellent	Good	Fair	Poor
Overall performance	74%	23%	2%	1%
Equipment reliability	72%	26%	1%	1%
Maintenance service	41%	39%	12%	6%
Ease of installation	63%	36%	1%	0%

To detail the potentially troublesome areas of installation and maintenance, Datapro's survey asked users how much time was required to install and test their add-on memory units. The answers ranged from one to 120 hours, and the average time was 20 hours.

Second, the users were asked what problems, if any, they encountered in installing and testing each unit. Of the 143 users, 35% reported no problems, 49% had minor problems and 16% encountered problems they considered serious.

Finally, the users were asked what problems, if any, they had encountered in diagnosing malfunctions and obtaining the necessary service. Although 45% reported no problems, 43% had minor problems and 12% had encountered serious problems.

Datapro identified in the report three major reasons for users to go to independent vendors for their memory: add-on, replacements and enhancements.

"More memory (add-on) enables the user to utilize larger I/O buffer areas, to take advantage of more powerful compilers and other sophisticated software facilities, and to use more and/or larger partitions in a multiprogramming environment. Increased memory capacity also reduces the need for time-consuming overlays and makes it possible to keep frequently used systems programs in core rather than on disk or tape," according to the report.

Datapro stressed there are financial rewards for placing as much memory with independents as possible. The report cited, for example, a 370/155 user who obtains 1M byte of main memory from Memory Technology rather than IBM can save \$6,465/1M on a two-year lease or \$368,000 on outright purchase.

The independent memory suppliers also offer extensions of main memory beyond the IBM-specified maximum capacities. IBM supplies a maximum of 64K bytes for the 360/30 (or 96K bytes on an RPO) 256K bytes for the Model 40 and 512K bytes for the Model 50. Also, 1M bytes for the 370/145, 2M bytes for the 370/155 and 3M bytes for the 165.

"It has long been clear that these limits are imposed by marketing considerations rather than technical considerations. From IBM's point of view it was comforting to know that a Model 40 whose memory requirements expanded beyond 256K would have to move up to the considerably more expensive Model 50 processing unit," the report continues.

Presently, the independents offer capacities up to twice the IBM-specified limits throughout the 360 range and most of the 370 range.

The report supplies names and addresses of the main vendors of memories and can be purchased through 1805 Underwood Blvd., 08075.

Off-Line Controller Takes Care of Printing

SANTA MONICA, Calif. — Off-line printing of data with an IBM 1403 printer is available through a Spur Products controller.

The basic SP-4 system consists of a controller, magnetic tape unit, minicomputer, teletypewriter console for operator input/output and a software package. The controller is compatible with the user's 1403 printer and allows the use of any print train including custom-designed fonts.

Also available is a dual printer DP-8 system, which includes two tape units and drives two printers.

The basic program supplied with the system reads data from a standard IBM spooling tape, transfers it to core memory and feeds it to the printer controller one line at a time. The program is organized to read the tape while the previous line is being printed. The printer is driven faster than when coupled with an IBM computer because invalid codes are recognized and modified instantly and an empty print train buffer is recognized when the last print hammer is fired.

Program Subroutines Modifiable

The basic program also contains program subroutines that can be modified by the operator to change the printing format.

A diagnostic program (to support maintenance and alignment of the printer) and hexadecimal tape-to-printer dump program are provided.

The system includes all logic cards, memories, mating connectors, power supplies and instructions for operating, programming and maintaining.

Options are a tester/exerciser, card reader, plotter, disk file, data communications link, high-density tape unit, CRT terminal, high-speed paper tape reader or read punch unit and spare circuit boards.

A single-printer SP-8 system leases for \$1,077/mo including maintenance. A dual-printer DP-8 system leases for \$1,770/mo. This is less than one-fourth the cost of a comparable system using an IBM 360/30 computer and two 1403 printers, a spokesman said. Spur is at 2928 Santa Monica Blvd., 90404.

It's only natural that the leader in computer terminals and data communications equipment would offer a multiple modem system as advanced, yet as simple to maintain as the Series 12.

Garard W. Schoenfeld,
Director of Marketing



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Are 370s Power Gluttons?

By Vic Farmer

Of the CW staff
While it is true that IBM's 370/135 and 370/145 consume more power both in operations and in need for cooling than somewhat comparable models in the 360 line [CW, Dec. 26-Jan. 2], other members of the 370 family are not the same power gluttons, and in some cases provide sizable power savings over 360 machines.

The 135 and the 145 use a bipolar silicon chip memory that sacrifices power and its resulting heat dissipation to obtain high access speed. The rest of the 370 line uses metal-oxide semiconductor field effect transistor (MOSFET) technology which although is slightly slower in access time does not consume as much power.

For example, in a comparison of a 360/65 and a 370/158, both with

1M bytes of memory, the 360/65 uses 35 kVAs and gives off 117,000 Btus, while the 370/158 uses 22.8 kVAs and gives off 64,900 Btus.

The 370/158, therefore, uses 65% of the kVAs and gives off only 55% of the Btus, but the 158 also provides 1.5 times the compute power, according to IBM.

And if the matter needs further confusion, three 360/50s with a total of 1.5M bytes of memory use 22.5 kVAs and give off 75,000 Btus which is about the same consumption as a 370/158. However the 158 has 5.4 times the processing speed of one 360/50 not counting the integrated controls, channel improvements, etc. of the 370... which all serves to point out that power consumption may not be the biggest worry of DP managers.

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Drawings Converted Into Digital Form

SCOTTSDALE, Ariz. — Talos' Cybergraphic tablet converts hand-generated drawings and other data into analog or digital forms as they are sketched, traced, marked or written. The Cybergraphic system senses and tracks pen position on its surface and translates position information into analog or digital signals for visual display, memory storage or data processing.

Prices on tablets, which range in size from 5 in. by 7 in. to 22 in. by 22 in., run from under \$1,000 to over \$2,500, depending upon quantity and configuration. Talos is located at 7311 E. Evans Road.

PDP-11 Add-On Has Parity Option

CONCORD, Mass. — Cambridge Memory, Inc. has added a parity option for its Expandacore-1 add-on memory system used with PDP-11/40 and 11/45 systems.

The option enables users of either PDP-11 model to obtain error-checking control for up to 120K words of main memory storage.

Base price for the parity feature is \$750, plus an additional \$100 for each 8K-word segment for which the parity bits are provided.

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You'll also receive a valuable reference notebook which will back up the information you'll receive at this meeting. The notebook will include sample vendor contract forms.

Roy N. Freed, a leader in this field, Roy Freed has specialized in computer-related legal matters for many years. He has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private practice with the Boston firm of Peabody, Brown, Rowley & Storey. He has authored many articles on the various legal aspects of computers — including "Computer Frauds — A Management Trap" (*Business Horizons*) and a reference book entitled "Materials and Cases on Computers and Law." Mr. Freed will personally conduct the entire seminar.

Should you attend this seminar?

If you're involved in the purchase of EDP equipment or services, the answer is a resounding "yes." Whether you're a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm, this seminar will pay for itself many times over. You just have to read the pages of *Computerworld* to realize how frequent supplier problems are — and how

For Videofile Users

Ampex Offers CRT, Two Printers

REDWOOD CITY, Calif. — Ampex has repackaged some of the components of its Videofile system to provide users with high-resolution CRT display and printouts. The first products include a computer output video (COV) page converter which permits transfer of digital data into high resolution television format, and two related printers — the VF-142 and the VF-145/00.

The COV page converter uses an Ampex TMZ digital tape drive to read the digital tape records from major mainframe manufacturers.

The COV, priced at \$40,000, includes memory and control units that automatically convert the digital page records into high resolution 1,280 TV line video images. These converted video images may then be routed directly to a display monitor with associated video buffer or, alternatively, to a videotape for storage and later retrieval.

The COV can convert two full 3,888-character pages from a digital tape of 800 bit/in. packing density.

Printer

The VF-142 printer uses a line-art CRT with a fiber-optic facsimile to print documents on electrostatic paper when fed a signal from a 1,280 scan line high-resolution television system.

The printer reproduces line widths of 0.004 in. over an 8-1/2 in. by 11 in. sheet of paper. The electrostatic process is dry, using a thermoplastic toner and zinc-oxide-coated paper in 2,100-ft. rolls. It produces clean, high-contrast copies every 3.2 sec. Cost per copy is approximately three cents, and the printer is base priced at \$75,500.

The VF-145/00 page printer produces one copy every eight seconds in continuous operation at approximately three cents per page.

Resolution is 200 line/in. and the first dry copy is developed within 14 sec.

The page copier uses a liquid toner and is heat fused. A special display tube includes a corresponding charge image on dielectric-coated printout paper, according to the company.

The image source for the VF-145/00 is a special high-resolution monitor, operating with an image format of 1,280 scan lines, 15 frame/sec, and is priced at \$19,300. Ampex is located at 401 Broadway, 94063.

ECRM 1800 Reads Courier-12 Type

BEDFORD, Mass. — ECRM, Inc. has announced a high-speed optical character recognition system for composing room applications.

The Model 1800 Autoreader processes Courier-12 typewritten copy at 1,800 word/min. and is claimed to make less than one error in every 20,000 characters read, for an error rate of .005%. The Model 1800 sells for \$65,000 and is available now from the firm at 205 Burlington Road, 01730.

Disk Cleaner Takes 3 Minutes

WALTHAM, Mass. — Kybe Corp.'s Model DP-30 disk pack cleaner is a self-contained disk maintenance system for all IBM 2316 and 3336-type disk packs.

Priced under \$4,000, the DP-30 uses the cleaning technique recommended by disk pack and drive manufacturers and by the American Standards Association Technical Subcommittee on Tapes and Disks.

The cleaning operation is completely automatic and takes three minutes. All recording surfaces are cleaned by electro-mechanically operated wiping pads saturated with isopropyl alcohol. The residual cleaning fluid is wiped by a second set of pads and evaporated.

Kybe is located at 132 Calvary St. 02154.

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CI Notes

2 Potter Patents Invalid

WARWICK, R.I.—Two of Potter Instrument Co., Inc.'s patents on line printers were ruled invalid here by District Court Judge Raymond J. Pettine in a patent infringement action brought by Potter against Odec Computer Systems, Inc.

Pettine ruled the two patents were invalid as they were "fully disclosed in the prior art."

Potter had charged Odec with infringement of its patents on the use of column spanning hammers in line printers and the use of printing slugs clipped onto timing belts.

One Judge Assigned 5 Suits

LOS ANGELES—Antitrust suits filed by five California firms against IBM are being assigned to the same judge for coordinated handling through trial.

This move is seen as a possible first step towards the combination of some or all of the suits filed by Memorex, Hudson General, Calcomp, Transamerica and Marshall.

U.S. District Court Judge Ray McNichols of Boise, Idaho, will hear the cases.

REI to Supply NCR Wands

DALLAS—Recognition Equipment, Inc. has signed a contract to supply NCR with up to 50,000 hand-held OCR wands to be used with NCR point-of-sale terminals.

This additional supplier contract will allow NCR to provide its customers with equipment capable of reading the OCR form recently endorsed by the National Retail Merchants Association as well as the NCR bar code.

Bunker Ramo Cuts Back

CHICAGO, Ill.—Bunker Ramo Corp. has laid off about 40% of its 1,400 employees in Trumbull, Conn., and consolidated the Information Products and Information Services divisions into an Information System Division.

A slackened demand for information systems in the securities industries was responsible for both actions, according to John R. Couts, president of the consolidated operations.

Supershorts

Pitney-Bowes Data Systems Ltd., a unit of Pitney-Bowes, Inc., said negotiations with International Computers Ltd. for ICL to acquire the point-of-sale terminals company have broken down.

Sorbus, Inc. has signed a contract to provide nationwide maintenance service for Electronic Memories and Magnetics Corp.'s end-user core memories.

Records for Quarter and Year

IBM, Burroughs Earnings Soar 23%, 32%

By Molly Upton
Of our staff writers

A tremendous fourth quarter at both IBM and Burroughs helped boost earnings and revenues at the two firms to record levels for both the year and the fourth quarter.

For the year, Burroughs earnings jumped 32% on a 22% rise in revenues, while at IBM, earnings rose 23% on a 15% increase in revenues.

At IBM, the amount of purchased equipment continued to rise during the fourth quarter, and World Trade Corp. continued to increase its contributions. IBM's fourth-quarter earnings jumped 38% from a year ago to \$468.7 million or \$3.20 a share, a record for any quarter in the firm's history. A year ago, earnings totaled \$340.4 million or \$2.35 a share.

Revenues rose 29% to \$3.24 billion, also a record for any quarter, from \$2.52 billion in the year-ago period.

Purchases High

"Accompanying a record rate of worldwide installations in the final quarter of 1973, outright purchases of DP equipment were at an all-time high for any quarter, and were higher for the full year 1973 than for 1972," observed Chairman Frank T. Cary.

The increase in gross income from rentals and services for the year was 14.5% over the previous year. The figure was 11% through the first quarter, 12% through the first half, and 14% through the first nine months.

For the year, IBM earned \$1.575 billion or \$10.79 a share compared with \$1.279

billion or \$8.83 a share in 1972. Revenues totaled \$10,993 billion up from \$9,532 billion a year ago.

Foreign operations showed a higher rate of increase over 1972 than domestic operations. "Due in part to various currency fluctuations and realignments during the past year," according to the firm.

Earnings from foreign operations rose 24% in 1973 to \$352.5 million from \$286.6 million in 1972, a slightly higher rate than for the firm overall.

Foreign revenues rose 24% to \$3.14 billion from \$4.15 billion in 1972.

World Trade provided 54.1% of total 1973 earnings, up from 53.7% in 1972, and 47% of 1973 revenue, up from 44% in 1972.

"Orders for IBM equipment and services during 1973 continued strong and at year-end the backlog of orders was higher than at year-end 1972 despite a record level of shipments," Cary said.

Burroughs Big Abroad

At Burroughs, fourth-quarter overseas orders sparked a 32% increase over orders received in the fourth quarter of 1972, with a 47% rise from overseas and a 25% gain from the U.S.

For the year, the order rate rose 27% over 1972.

Burroughs earned \$115.9 million or \$6.01 a share in 1973, a 32% rise over 1972 earnings of \$87.5 million or \$4.71 a share.

Revenues rose to \$1.284 billion from \$1.053 billion a year ago. Revenue growth in 1973 was strong for both the U.S. and overseas operations, and revenue gains were recorded in all product areas, the firm said.

The sector comprised of small EDP systems, business minicomputers and small application machines led the way in rising orders, showing a 32% improvement over 1972, while orders for large and medium EDP systems rose 28%, and business forms and supplies 21% over 1972 order performance.

In the second fourth quarter, Burroughs earnings rose 28% to \$49.7 million or \$2.57 a share compared with \$38.7 million or \$2.08 a share in the year-ago period.

Revenues rose 18% to yearly \$389 million from \$330.1 million.

Worldwide backlogs at year-end established new record levels, exceeding the 1972 year-end position by 30%.

"Despite the uncertainties created in the world economy" by energy problems, "business capital spending plans continue to be strong for 1974, and this should have a favorable impact on the EDP industry," observed Chairman Ray W. Macdonald.

"Our expectations for 1974 continue to be for good growth in both revenues and earnings," he added.

Industry Census Under Way, Seeks Responses From Over 2,500 Firms

By a CW staff writer

NEW YORK—More than 2,500 companies will be served subpoenas by May 1 to produce documents and respond to questions in the second industry census conducted by IBM and the Department of Justice. The purpose of the census is to assess overall market shares and competitive conditions in the industry for use in the U.S. vs IBM antitrust case.

Protecting the confidentiality of information supplied to the second census will be much more difficult than it was in the original census conducted in 1970 and 1971, because, according to industry sources, Judge David N. Edelstein, who is trying the government case, indicated a strong preference for avoiding any general protective orders, such as the one used then.

He cited the presumed public benefit from the case and the need for conducting all aspects of the case in public. However, he did not rule out temporary or limited protective orders, or protective orders for particular witnesses and information.

The first census, taken as a part of the Control Data, DPFAG, ADR and Programmatic suits, involved some 2,000 companies.

Due to the confidential nature of much of the information requested, a blanket protective order was entered by the court prohibiting disclosure of information to anyone other than the court and counsel for parties.

The census information was not used in the Control Data case, which was settled out of court in January 1973. However, census material was used in the Greyhound and Telcel cases and was the basis for many of the tables and summaries

presented by all parties, although the entire census was never released from the terms of the protective order.

Recently Judge A. Sherman Christensen permitted transfer of the information to a new New York court hearing the government case and permitted disclosure to Justice attorneys, but to no other parties [see Page 1].

In order to obtain more current information, IBM and Justice began retaking the census last year.

Firms receiving notices must comply promptly and thoroughly, and in all events must file any objections within 10 days of receipt of the subpoena. Although some flexibility in scheduling can be permitted, the entire deposition program must be finished by Sept. 1 and most of it is expected to be finished by June 1.

The cost of complying with such legal subpoenas generally is borne by the witness but the court may take a sympathetic view of requests by small companies to be reimbursed for out-of-pocket expenses.

Counsel for both IBM and Justice expressed concern that such practice would become very expensive for them. IBM counsel noted that payment of statutory witness fees and mileage allowances was made upon request and that IBM and Justice lawyers would work closely with smaller companies in particular to minimize their inconvenience and other problems.

Both the Justice and IBM attorneys indicated that "little fish" or small companies for which compliance with the subpoenas is quite burdensome might be excused from compliance without unduly distorting results of the census.

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Will Japan Raise Firm's Prices?

Public-Private Competition Hot

By Shukan Computer

Special to Computerworld

TOKYO—The Japanese computer industry faces the timely question of what to do when a public company, which can afford lower prices, competes with private companies. Japanese private computer centers around the country are complaining that the service fees of Japan Telephone & Telegraph Co.'s data communication service system are too low.

On Oct. 17, the Japan Information Center Association sent an official statement of request to the Minister of Postal Service to consider the problem of competition between TAT Co.'s data communication services and the services offered by the private computer centers.

When the Ministry of Postal Service approved the expansion of the Sales and Stock Control Service (Dress) to 19 cities by multiplexing, the ministry pointed out to TAT Co. the necessity for reexamination of the price/fee for making the contract of using data communication facilities and enforcement of the fair competition with the private information service companies.

To meet these conditions, the TAT Co. has investigated the possibility of raising the price of data communication services. According to TAT Co., the price will go up before March 1974 at the latest.

A big change in the prices may arise, according to TAT, since the present rate was determined five years ago and may not now reflect the actual situation.

User Needs

But the potential rise of these fees and prices in order to meet the request from the private computer centers is a grave concern for users of the TAT Co.'s services. It is possible that a movement against the price rise will begin soon. How will the company deal with two

extreme requests, namely that of the private computer centers to raise the price and that of its own users not to raise the price? This is TAT Co.'s dilemma.

However, the basic issue is whether any public organization can be allowed to begin a business in a total competition against private companies.

At the present time, private software industries or computer centers are located

International News

in almost all main cities in Japan. TAT Co.'s project seemingly intends to break through the activity of private industry.

On the one hand, the Ministry of International Trade and Industry has been making an effort to promote the software industry in Japan by subsidizing the private companies.

On the other hand, the Ministry of Postal Service approved TAT Co.'s computer service project which would stop the promotion of software industry within the private companies.

Australia Turns To Mark III

Special to Computerworld

SYDNEY, Australia—Direct time-sharing systems harnessing at least 16 major computers based in Cleveland, Ohio, are now available in this country through GE's Mark III.

It is reportedly the first time a computer company has used one of its massive data centers overseas to capture a large share of the Australian market, estimated currently at \$75 million a year, and growing 15% annually.

The country claimed it already had 25% of the Australian data services market with a total of 250 customers.

Here's what you always wanted to know about your IBM 370.

Never before has so much confidential information been available to the computer user.

Thanks to actions in Federal Court, IBM's internal papers on its IBM 370 have been brought to light. These "Greybooks" contain a wealth of previously unavailable information on the various models of the 370—including detailed plans for last year, next year, and every year through 1980. Even IBM salesmen haven't seen most of it. And it can be an invaluable planning tool for any computer installation.

Now these Greybook reports are available to you—in clear, easy-to-read book format—with a page-by-page commentary by the well-known, user-oriented columnist, Alan Taylor.

Almost every page has some information that will help your installation. Alan Taylor's commentary, spotlighted by a specially designed format, provides additional relevant information, and helps make each volume into a practical, useful tool for everyone concerned with the 370. As user, manager, controller, programmer, planner or salesman, there is something here for you. You need a copy of one or more of these books for your professional purposes—and you will want your colleagues to have their own copies so that you can work together.



The facts in these books are fascinating. Among other things they contain are:

- IBM's own analysis of the advantages and disadvantages of 370 models against the competition. (Your Software and Hardware experts both need this information.)
- The descriptions of the planned enhancements for System 370's—and the dates involved. (Your Financial man needs this to help with Rental/Purchase decisions.)
- IBM's plans for the "death" and replacement of 370 models—and data about their successors. (A unique feature that everyone should read and understand.)
- IBM's use of error-containing hardware for part of the 370 line—hardware that was supposed to be scrapped.
- And much more.

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March 26-28 in New York

Intercon '74 Offers 40 Half-Day Sessions

NEW YORK—Three days crammed with 40 half-day sessions are in store for those attending the 1974 IEEE Intercon

convention and exposition.

The product exposition will be held in the New York Coliseum, while the technical program will

be held at the Statler Hilton Hotel, March 26-28.

Program sessions are concentrated in five high-interest subject areas: solid-state electronics, computers and information, instruments and instrumentation, communications and marketing and finance.

Sessions of particular interest on the first day include "The Foreign Market to Capture the U.S. Markets," "The Semiconductor Crunch: When Will Deliveries Catch Up With Demand?" and "Testability—The Key to Automation in Circuit Testing."

Other sessions on Tuesday will deal with point-of-use systems, an examination of reducing computing costs and a session on new international markets.

Database systems, microprocessor architecture, switching systems control by minis and advances and trends in computer storage will be examined on the second day of the conference.

A Wednesday afternoon session will explore the possibilities of developing the new end-user markets for electronics.

Thursday's program includes a look at data networks, the use of memory and venture capital.

IEEE Intercon '74 exposition offices are at 3600 Wilshire Blvd., Los Angeles, Calif. 90010.

Contracts

Amplex Corp. has received a contract valued at over \$1 million from Xerox Corp. to supply TMA model tape drives for use in the off-line model of the Xerox 1200 printer.

Teleprocessing Industries, Inc. has received a contract from ITT World Communications, Inc. for an undisclosed number of automatic calling and answering units for use as part of the communications interface between the TWX network and ITT Worldcom's overseas Telex subscribers.

Inter-Computer Electronics, Inc. (ICE) has signed an OEM agreement to purchase Digital Equipment Corp.'s PDP-11s for use with ICE's line of Pulse and Transient Recorders and data acquisition and processing systems.

Data 100 Corp. has been awarded a three-year lease contract to provide terminals to the U.S. Department of Interior, Geological Survey. The units will be used in a network studying natural resources.

Systems, Sciences and Software has received a contract from the Oregon State Highway Department to analyze and predict the quality of air in and surrounding a proposed freeway section near Portland.

Computer Sciences Corp. has received a contract to provide computer-based services to the Naval Electronics Laboratory Center for the development of communications processing and tactical systems.

Terminal Data Corp. has been awarded a \$2.4 million contract by Burroughs Corp. for microfilm equipment.

Chilton Corp. has been awarded a five-year automation contract by the Credit Bureau of Austin, Texas.

Computer Sciences Corp. has received a three-year contract extension for computer facilities management from the Atomic Energy Commission's Nevada Operations Office.



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Here are just some of the subjects we'll cover in our seminars.

Our major one-day seminar for the U.S. is called the Industry Briefing Session. And it will include:

- Computers as a worldwide industry
- Fundamental demand for EDP products and services
- General purpose computers—ships, installed base and forecast
- Minicomputers—continued surge in 1974
- EDP services and the automation industry—status and future
- Governmental impact on the computer industry—threat to industry growth

Special address by Dr. Herbert Grossh

Dr. Grossh, editorial director of *Computerworld*, former head of the National Bureau of Standards' research program in computing technology, and well-known author of "Growth's Law," will give a luncheon talk on *Computing: The Next 10 Years*. He will describe the

possible in terms of hardware and software technology, but will also cover the probable changes in worldwide user acceptance of new technologies.

New this year:
INTERNATIONAL DAY

We've added a second day to our 1974 Briefing Session seminar to give proper attention to the rapidly expanding international marketplace. The day will be divided into two parts:

European Computer Marketplace

This session will include:

- User spending in Germany, France and U.K.
- 1974 demand and spending trends
- Installed base by supplier, country and industry
- Data entry and terminals—status and trends

• The software industry in Europe

Japan's Computer Marketplace

Including valuable information on:

- Business environment in Japan—impact of energy crisis
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- Minicomputer market
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• Governmental planning and EDP policy—liberalization of restrictions on externally produced EDP equipment.

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All attendees at IDC's International Day will receive a free trial subscription to either our *Europe Report* or our *Japan Report*—a \$35 or \$30 value.

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Whether you attend the Industry Briefing Session or International Day, you will receive a free copy of our comprehensive Data Book—a briefing session in itself, including all seminar slides and forecasts. There is a different data book for each day, full of the facts you want to keep (100 pages for the Industry Session)... a \$95 value.

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Special note to financial analysts: We've set aside a special day (Feb. 26) for you in New York. It will cover the material included in our *Industry Briefing Session*, but the discussion—and audience participation—will be aimed at investor interests. Join some of Wall

Street's best computer watchers at this seminar!

There's not much time to enroll, so act now

Our New York Computer Industry Briefing Session is coming up very soon, and whether you want to attend the Industry Briefing Session Day or International Day or both, now's the time to make your reservations. The coupon has all the details on time, place and costs. If computer marketing is your field, fill it out right now and you'll be sure of a place when the information starts flowing. You couldn't pick a more productive way to spend a day.

Registration fee includes Data Book and all conference materials. Cancellations accepted with full refund, if notice received at IDC, 60 Austin St., Newtonville, Mass. 02160. Attn: Seminar Coordinator, by Feb. 22. Personnel may be substituted at no charge. Registration schedule/fees:

	Fin'l Analyst Session	Japan Half Day	Europe Half Day	Industry Session
New York Hilton Hotel	Feb. 26 \$225*	Feb. 27 \$135†	Feb. 27 \$135†	Feb. 28 \$225*
Rockefeller Ctr.		\$225 Full Day		
Los Angeles Marriott Hotel		Mar. 6 \$135†		Mar. 5 \$225*
Int'l. Airport				

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† Includes 3-mo. subscription to EDP Japan Report or EDP Europe Report

Please register the following for IDC's Computer Industry Briefing Session as follows (Please Print) Session Date

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Attach additional names as required, specifying city and session.

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SYSTEMS ANALYSIS/PROGRAMMERS Need hardworking, aggressive people with data communications, bank or business background. COBOL a necessity. Burroughs B3600 or B4700 background desirable. All replies confidential. Send resume or call 1-414-278-0013. MIDLAND DATA PROCESSING Division of Midland National Bank 231 W. Wisconsin Avenue Milwaukee, Wisconsin 53203	PROGRAMMER Growing Midwest mail order firm needs person with experience in mailing lists maintenance programming with emphasis on disposition. Should be accustomed to working with lists in the 1,000,000 size range. Send resume with salary requirements to CW Box 4019 787 Washington St. Newton, Mass. 02160	PROGRAM MANAGER DATA COMMUNICATIONS Suburban Washington D.C. firm is seeking an individual with solid computer/communications and system design experience. Technical management and customer interface experience required; position will involve system design and implementation, mini-computer, intelligent terminal, concentrator, and other hardware/software evaluation. This new position offers substantial opportunity for personal and professional growth. Salary 20-30K. Please submit resume to: CW Box 4623 787 Washington Street Newton, Mass. 02160 An Equal Opportunity Employer	SYSTEMS ANALYSTS PROGRAMMERS Opportunity to Develop and Grow with the Regional Criminal Justice Information System for the Toledo Metro Area Need professionals with experience in: - Crime design and implementation - Criminal Justice application - Preferred experience includes IBM 370/145 using ANS COBOL Salary: 12 - 18K Excellent benefits Send resume to: Toledo, Ohio Regional Criminal Justice Information Planning Unit 1100 Jackson Street Toledo, Ohio 43624	GENERAL MANAGER REBANKMARKETING COMPANY Opportunity for experienced dealer or broker in the progressive computer equipment market to direct a new company being created for the computer market with initial home office on the East Coast. This position is being filled with major 370/150 and the right man with some computer experience, initiative and equity appreciation. Individual should be a multi-skilled manager with excellent reputation within the industry. Please write to: CW Box 3830 787 Washington Street Newton, Mass. 02160

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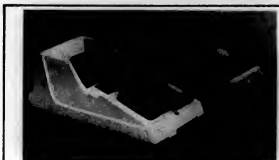
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Expanded Line, Vertical Integration Main Themes in '73 at Data General

By Molly Upton
Of the CW Staff

BOSTON — Expansion and vertical integration were two themes at Data General Corp.'s recent annual meeting, where shareholders learned from President Edson DeCastro that 1973 was a year of "notable achievement."

Shipments more than doubled over those of 1972, to more than 4,000 computers, he said. At the end of the year, Data General employed 1,700 persons, compared with 840 a year ago.

International operations assumed an increasing role, with revenues accounting for 29% of consolidated sales, up from 26% in 1972.

New products included both the top of the line Nova 840 and the smaller Nova 2, as well as the development of a 16K word core module offering twice the memory for the same cost, DeCastro said.

The move toward vertical integration and in-house manufacturing capabilities accounts for some of the expansion that occurred in 1973, DeCastro said. Data General now makes its memory, read/write heads for disks and paper tape readers in-house, and expects to bring other products in-house in the near future, he added.

The firm also has a core assembly facility in Hong Kong, to develop a semiconductor research and development unit in Sunnyvale, Calif.

The first quarter of fiscal 1974 was a period of transition, with the Nova 2 and larger memories added to the family.

Earnings in the period ended Dec. 22 rose to \$1.9 million or 23 cents a share compared with \$1.3 million or 15 cents a share last year, adjusted for the 3 for 1 stock split in February.

Revenue jumped to \$14.8 million from \$9.8 million a year ago.

DeCastro declined to speculate

whether margins of improvement evidenced in the first quarter would continue throughout the year, but said the rate of incoming order is strong both domestically and internationally, and the firm "expects to make progress" during the year.

In the year, Data General earnings rose to \$6.7 million from \$3.9 million, while revenues jumped to \$53.3 million from \$30.3 million.

Continuing POS

Data General is continuing development of a point-of-sale system designed for supermarkets, and hopes to have a unit in a test environment in a store within six to nine months, he added.

Cordura Posts \$16.6 Million Loss, Cites Provision for Divestitures

LOS ANGELES — Provisions for planned divestitures were cited in a \$16.6 million loss for the year at Cordura Corp. The loss compares with earnings of \$7.5 million or \$1.20 per share in 1972.

The loss for 1973 included a reserve of \$16.2 million for anticipated losses to be incurred in the planned divestitures of its credit reporting unit, Computer Credit Corp., and certain units in its marketing and information services businesses.

Revenues were up to \$88.8 million from \$74.9 million a year ago.

Income from continuing operations totaled \$5.5 million, down slightly from \$5.6 million in the same year-ago period.

President Norman E. Friedman said, "The major criterion to sell some operations was the minor relative position of each in the markets they serve. Continuation of these businesses in 1974 would have required a disproportionate expenditure of resources in contrast to results

Backlog is growing and delivery times have lengthened to between 120 and 150 days for the 840 and 90 to 120 days for the 2, DeCastro said.

This is roughly 30 to 45 days longer than previously. The firm is trying to expand capacity to reduce lead time, he said.

Figuring when another facility will be needed is "under active consideration," he said. Data General has no current plans for additional equity financing, he added.

In response to a question, DeCastro said that at this time the effect of microprocessors on the mini market is basically nonexistent. However, the technology is dynamic, and the picture could change, he added.

expected in our other large and better-positioned business else.

The firm also incurred a charge of \$2.4 million for a change in accounting practices, and all figures have been restated to reflect the changes.

Greyhound Slips

PHOENIX — Greyhound Computer Corp. reported earnings of \$698,000 or 16 cents a share for the third quarter ended Sept. 30, down from \$1 million or 24 cents a share in the same period a year earlier.

For the nine months, earnings totaled \$1.9 million or 45 cents a share, down from \$3.2 million or 74 cents a share in the 1972 period.

Revenues were \$12.1 million in the third quarter and \$33.4 million in the first nine months of 1973, compared with \$11.7 million and \$35.6 million, respectively in 1972.

Revenue figures for 1972 have been restated to give effect to full consolidation of foreign subsidiaries. The restatement had no effect on earnings, Greyhound noted.

The 1973 figures include results of Bresnahan Computer Corp. from the date of its acquisition on June 1, 1973.

AMS Makes Fourth-Quarter Profit

SUNNYVALE, Calif. — Advanced Memory Systems, Inc.'s fourth quarter earnings totaled \$55,000 or 3 cents a share on revenues of \$8.2 million.

This compares with restated earnings of \$334,000 or 18 cents a share in the year-ago period, including a \$186,000 extraordinary credit.

The results were restated to include operations of Computer Microtechnology, Inc. prior to its acquisition in May 1973.

For the year, AMS lost \$196,000 or 16 cents a share compared with a restated 1972 loss of \$429,000 or 41 cents a share.

Revenues rose to \$31.4 million from \$14.5 million a year ago. Excluding results of CMI prior to its acquisition, AMS earned \$513,000 for the year including \$160,000 in special credits.

Orders Improve

An agreement with RCA to process wafers at the former CMI facility has eliminated the losses incurred previously in that area, according to President Robert H.F. Lloyd. The new or-

der rate has improved significantly both in the OEM and end-user parts of the business, he added.

TELETYPE® ACCESSORIES

IDLE LINE MOTOR CONTROL

All Solid-State Motor Control with adjustable inactivity timer eliminates unnecessary mechanical wear and lubrication deterioration by automatically disconnecting power to the motor when no information is being exchanged. Power is restored in less than one millisecond after transmission resumes. Delay interval, continuously adjustable from 30 seconds to fifteen minutes. Separate send and receive line inputs to the Motor Control allow its use for half or full duplex operation. Installs in any model 32/33 Teletype in minutes without drilling or soldering; clamps onto pedestal next to tape reader power supply. Supplied with interconnecting cable.

\$62.50

uds TELEPHONE: 802-288-2448
UNITED DATA SERVICES COMPANY, INC.
3024 NORTH 33RD DRIVE, PHOENIX, ARIZONA 85017

Earnings Reports

**NATIONAL INFORMATION
SYSTEMS**

Nine Months Ended Sept. 30		
	1973	1972
Earnings	\$.07	\$.
Revenue	6,903,000	5,855,0
Expenses	269,000	253,0

COMPUTER DATABANKS
Nine Months Ended Sept. 30

	1975	1972
Ernd	6.13	6.
venue	1,137,308	904,9
nings	51,570	46,5

NETWORK DATA PROCESSING
Six Months Ended Sept. 30

	1973	1972
hr Ernd	\$0.02	\$0.1
revenue	783,649	998,74
Earnings	15,221	75,46

ELECTRONICS
Year Ended Sept. 30
1972 1973

	1973	1974
Per Ernd	8.42	8.0
Revenue	3,905,803	2,028,21
Earnings	392,396	87,88

NATIONAL DATA
Six Months Ended Nov. 30

	1975	1974
End	\$15	\$1
Revenue	16,387,832	8,490,27
Costs	8,321,00
Net	765,196	932,30

L. The 1972 results exclude revenues and costs, but include the profit from operations, on a cost

COMPUDYNE

	Year Ended Sept. 30	
	1973	1972
Earnings	\$1.16	\$1.11

Revenue	26,190,553	22,967,655
Cred	68,000	388,911
ings	714,937	712,411
o Shr	.04	.00
Revenue	6,220,492	5,836,411

Cred	164,41
hings	183,030	245,28

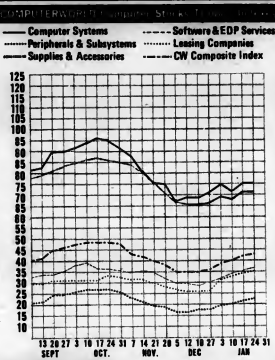
INSTRUMENT SYSTEMS		
Year Ended Sept. 30		
	1973	1972
Ernd	\$17	\$1

Revenue	199,555,000	190,099,000
Exp. Chg	500,000	386,000
Profits	1,633,000	1,132,000

consists of losses on long-term investments and discontinued and operations, less gain from sale of subsidiary stock and excess tax reserves.

MILGO ELECTRONICS
Year Ended Sept. 30

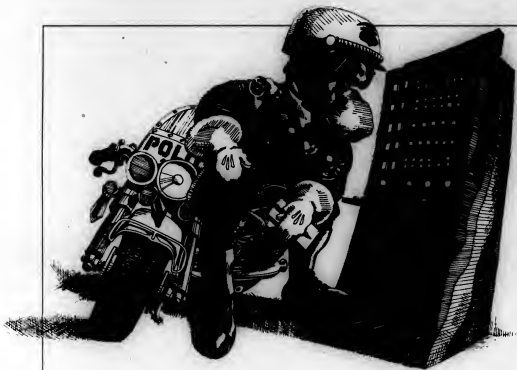
	1973	1972
Ernd	\$1.89	\$1.1
Revenue	21,854,000	13,824,0
arnings	2,990,000	2,107,0
to Sh	45	



Computerworld Stock Trading Summary

All statistics compiled,
omputed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

RANK	FIRM	PRICE-EARNINGS RATIO					RANK	FIRM	PRICE-EARNINGS RATIO					RANK	FIRM	PRICE-EARNINGS RATIO				
		1973-74							1973-74							1973-74				
		NAME	CLOSE	MEAN	NET	PCT			NAME	CLOSE	MEAN	NET	PCT			NAME	CLOSE	MEAN	NET	PCT
		(1)	1974	CHNGD	CHNGD			(1)	1974	CHNGD	CHNGD			(1)	1974	CHNGD	CHNGD			
COMPUTER SYSTEMS																				
A	PURPOSECO INC	175-252	195 3/4	+	-2.0	O	ADVANCED COMP TECH	1-2	2 1/8	0	0-8	C	COMPUTER COMMUN	1-4	1 1/8	1/8	-18.0			
N	COLLIER RADCO	16-24	24 3/4	+	-2.0	O	APPLIED DATA MES.	2-4	2 1/8	1/8	0-8	C	COMPUTER MACHINERY	4-13	5/8	1/8	-16.0			
N	COMPUTER COMMUN	1-4	1 1/8	1/8	-18.0	O	ATOMIC DATA PROC	3-4	63 3/4	-2 1/8	0-8	C	COMPUTER MACHINERY	4-13	5/8	1/8	-16.0			
N	CONTROL DATA CORP	31-62	32 1/2	-1 5/8	-0.7	O	ATOMIC DATA PROC	3-4	63 3/4	-2 1/8	0-8	C	COMPUTER MACHINERY	4-13	5/8	1/8	-16.0			
N	CITICORP CORP	10-10	10 1/2	0	0.0	O	CENTRAL DATA SYSTEMS	4-13	5/8	1/8	-16.0	C	DATA PROCESSING	1-4	1 1/8	1/8	-18.0			
N	DATAPOINT CORP	10-10	12 1/2	0	0.0	O	COMPUTER DATA SYS	1-2	1/2	0	0.0	C	DATA RECOGNITION	3-13	1 1/2	1/8	-12.0			
N	DIGITAL EQUIPMENT CORP	73-117	100 1/2	+	+9.2	O	COMPUTER DYNAMICS	1-2	1/2	0	0.0	C	DATA RECOGNITION	3-13	1 1/2	1/8	-12.0			
N	ELECTRONIC ENGINEERS	10-11	11 1/2	1/8	1/8	O	COMPUTER NETWORKS	1-2	1/2	0	0.0	C	ELECTRONIC & M	3-6	1/8	1/8	-12.0			
N	GENERAL AUTOMATION	22-35	34 3/4	+1 1/4	+3.7	O	COMPUTER TASK GROUP	2-3	3/4	0	0.0	C	ELECTRONIC & M	3-6	1/8	1/8	-12.0			
N	HEWLETT-PACKARD CO	70-99	80 3/8	+1 1/4	+9.3	O	COMPUTER TASK GROUP	2-3	3/4	0	0.0	C	ELECTRONIC & M	3-6	1/8	1/8	-12.0			
N	INTECHNICS INC	2-10	10 1/2	0	0.0	O	COMPUTER TASK GROUP	2-3	3/4	0	0.0	C	ELECTRONIC & M	3-6	1/8	1/8	-12.0			
N	INTECHNICS INC	2-10	10 1/2	0	0.0	O	COMPUTER TASK GROUP	2-3	3/4	0	0.0	C	ELECTRONIC & M	3-6	1/8	1/8	-12.0			
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N	INTECHNICS INC	2-10	1																	



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